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EDITED AND PUBLISHED MONTHLY BY

Simon J. J. Harger, V. M. D., Leonard Pearson, V. M. D.,
John W. Adams, V. M. D.

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THE
VETERINARY MAGAZINE.

VOL. II. MARCH, 1895. No. 3.

TUBERCULOSIS.

BY DR. D. E. SALMON,
Chief of the Bureau of Animal Industry.

It was not without considerable hesitation that I accepted the invitation to address this meeting on the important topic of tuberculosis. While the subject has long been under investigation, and it has been my duty as well as my pleasure to devote a great deal of attention to it, I believe there is no one in this room who feels more keenly than myself the deficiencies in our knowledge, and the uncertainties of the results which are to follow from all the agitation in regard to this disease.

We must all admit that a most important and serious question is pressing itself upon us for attention. We cannot dodge it if we would; and, as with most other important issues, it is better not to attempt to dodge it, but to consider it calmly and deliberately, as becomes this age of knowledge and reason.

All classes of people are interested in the problem of how best to control this disease. The producer of dairy products is intensely interested, because his property and his business are at stake. The consumer of dairy products is no less interested, because he fears that the health of himself and family are endangered. Boards of Health and veterinarians are interested, because it is their business to demonstrate with what neatness and dispatch they are able to handle subjects which come within their province, no matter how tremendous the magnitude or how momentous the result.

This body of citizens may, I take it, be regarded as a deliberative body. The majority of those assembled here are intensely interested in learning the exact facts concerning

tuberculosis in order that they may use their influence in properly shaping any measures which may be adopted for its control. The citizens are the jury—they should decide what is to be done; and in presenting the facts for the jury's consideration, I hope I may be so fortunate as to maintain the position of an impartial expert witness, and avoid the bias of the advocate.

Before we can intelligently discuss the measures which should be adopted in dealing with tuberculosis, and the manner in which they should be enforced, it is essential that we should agree upon the principal facts which have been decided in connection with this disease. What are these facts?

In the first place, the disease, with animals, is principally observed with milch cows. It may be found occasionally in steers, in calves and in swine, and very rarely in other animals, but it is the dairy herd in which it is most frequently discovered, and toward which any sanitary measures must necessarily be directed.

In the second place, from the data now at hand, I cannot admit that a less proportion than twenty per cent of the dairy cows will be found affected, if a careful test and thorough examination is made.

Thirdly. We may assume that the greater part of these cases, not all, may be detected by the tuberculin test and by physical examination. Tuberculin is not an absolutely infallible test; it indicates that some animals are tuberculous when no tubercles can be found in them, and it fails in some cases which are certainly tuberculous.

Fourthly. Properly prepared tuberculin does not injure the healthy cows upon which it is used. It may affect the milk supply of the herd during the test, and perhaps for a few days afterwards, but it cannot produce tuberculosis, and, on the other hand, has a tendency to increase the animal's powers of resistance to the contagion.

Fifthly. Tuberculosis is strictly a contagious disease. It is caused by a bacillus, and cannot develop under any circumstance unless the bacillus is present. This bacillus does not in our country multiply outside of the animal body, except in laboratories where special conditions are provided, and even then it is a very difficult matter to grow it. This germ, consequently, lives but a limited time outside of the body; and other

animals must take it into their system after it has been discharged by some affected animal, and while it is still alive, in order to contract the disease.

Sixthly. Tuberculosis spreads from cow to cow in a herd. It is most frequently communicated by the discharges of an affected animal which become dry, pulverized and carried into the air as dust, but is often contracted through contaminated food. We must admit that people may contract the disease, just as do cows, from breathing the dust of contaminated stables, and from drinking the milk of cows in an advanced stage of the disease or when the udder is affected. In cases of generalized tuberculosis the meat may also be dangerous, particularly if not well cooked. The danger from the milk and meat has been greatly exaggerated so far as adults are concerned, but infected milk is undoubtedly a serious menace to the lives of children.

Seventhly. The disease which we know as consumption in man is tuberculosis of the lungs. About 110,000 people die every year from it in the United States. Only a very small proportion of the cases of consumption can be suspected of arising from infected dairy products or meat. The location of the disease indicates that the germs have been breathed into the lungs in the form of dust, and not taken into the system by way of the stomach. On the Island of Nantucket, I am informed by the Massachusetts Board of Cattle Commissioners, there is more tuberculosis in man than in any county in the State. Yet there was only one per cent of bovine tuberculosis, and these few cases could be traced to recent importations from the mainland. Evidently the people there have contracted their tuberculosis from other sources than the dairy cattle. There is almost nothing in the way of facts having a direct bearing to indicate how much of the tuberculosis of man is due to infection from animals.

Having briefly enumerated some of the principal facts concerning the disease under consideration, the question naturally arises, what can you do about it? There are two plans, either of which may be adopted. One plan is the radical course such as has been adopted in Massachusetis, which involves the testing with tuberculin, within a comparatively short period, of all the cows in the State; the slaughter of those which react; the disinfection of contaminated stables; the testing of all new

cows purchased ; and the retesting of all cows in the State as often as may be found necessary.

The second or conservative plan is to educate the dairyman, so that he may eradicate the disease from his own herd ; to afford him an opportunity to obtain skilled veterinary assistance and tuberculin ; to bring to bear such pressure through the control of the milk supply and the meat inspection of cities and towns as may be advisable ; but all with the idea of encouraging and influencing him to do this work himself, or to assist him in doing it, rather than to have the State come in with its police power and attempt to do it for him arbitrarily, peremptorily, and immediately.

You cannot be expected to decide between these two plans without a more explicit statement as to what they involve. Take the first plan, what for example, would be the expense of an attempt to eradicate tuberculosis from Pennsylvania by immediate and peremptory inspection and slaughter, estimating by the data now at our disposal ?

The statistical division of the Department of Agriculture estimates that there are on farms in this State 938,000 cows, and we may safely add 62,000 more in cities and towns, making in round numbers 1,000,000 cows upon which to base our estimate. About 20 per cent of these or 200,000 will be found tuberculous, and these valued at $25 per head would be worth $5,000,000. If the farmer is given but half value for these, he would be taxed practically $2,500,000 in addition to his share of taxation for the sum which is actually paid to him.

In my opinion, this financial loss is only a part, and possibly only a small part, of what the farmer would be called upon to suffer under this plan of operations. The testing of a herd of cattle involves trouble to the owner and loss of milk from shrinkage. Should tuberculosis be discovered, the unexpected seizure of a portion of the cows and the necessity of securing milk elsewhere, to replace this yield, may cause considerable inconvenience and expense. The loss of custom and reputation which often follows from having a portion or all of the herd seized and slaughtered by the State, on account of the discovery of disease, is probably to the farmer the most serious matter connected with this method of procedure. It may ruin his trade and drive him out of business. Finally, there is the difficulty of obtaining sound cows to replace those which are

slaughtered. If a sufficient number of inspections are made to be consistent with this radical plan of work, there will be so many cows slaughtered that it will not be an easy matter to purchase cows at reasonable rates, and particularly such as have been tested and found free from disease.

I believe the person would find it to his interest to eradicate the disease from his own herd without compensation from the State, and do it at his own convenience, rather than have the State enter upon his premises unexpectedly, seize and slaughter his cattle, and compensate at the appraised value.

There are, however, other difficulties in the way of this radical plan which it appears to me have not been fully considered by its advocates. The testing with tuberculin of all the cows in a great State like Pennsylvania is a stupendous undertaking. Massachusetts has made the greatest effort in this direction of any State in the world, so far as I am aware, and animals have been tested there at the rate of 600 per week. The Bureau of Animal Industry has been able to supply the Massachusetts Board of Cattle Commissioners with 600 injections of tuberculin per week in addition to that called for from other parts of the country. The total quantity manufactured so far has not exceeded 1000 injections per week ; but preparations are now in progress which will enable us to supply two or three times this quantity.

If now we estimate that 1000 cows a week are tested in this State, it requires but a slight knowledge of arithmetic to discover that it will be 1000 weeks, or 19 years and 12 weeks, before all the cows in the State have been tested. Evidently this rate of progress would not answer, for long before the inspection had crossed the State, the present generation of cows would have disappeared and a new one would have taken its place.

For success in eradicating tuberculosis by this plan all of the cows should be tested at least once a year. This would make it necessary in this State to test 19,230 cows a week. Where are the experienced veterinarians to come from for this tremendous undertaking and above all where can a sufficient supply of reliable tuberculin be obtained ?

I estimate that six veterinarians and twelve assistants may test 1000 cows a week. Two additional veterinarians with four assistants may slaughter the 200 diseased cows which should

be found and make the post-mortem examinations. No one can contest the desirability of such careful post-mortems to determine how the work is running, how careful the inspections are, and how many errors are being made. On this basis one veterinarian and two assistants would be required for each 125 cows inspected weekly.

In order to test 19,230 cows a week, there should be a force of 153 veterinarians and 306 assistants. The salaries of experienced veterinarians would average $1600 or more ; that of the helpers about $700. This would make an annual expenditure for salaries of $459,000. Figuring the daily expenses of a veterinarian and two assistants at $5.00 this item amounts to $238,680. Personally I do not believe the State would compensate at a less average than $18 per head for slaughtered cows. This average for 200,000 cows would amount to $3,600,000. Adding these several items together we have a total expense of $4,297,680, for going over the cows of the State the first time. In this estimate no allowance is made for the items of burying carcasses and disinfecting stables, both of which would be necessary, but the cost of which cannot be predicted.

If 20 per cent of the cows in Pennsylvania are killed in one year, must not others be obtained to fill their places? If so, it would be necessary to have these tested. This means additional work of inspection and additional compensation for slaughtered animals. In the estimate which we have just made, the cost of inspection, slaughter of diseased animals, etc., equals $4.29 per head for each cow inspected ; and this, for the 200,000 purchased to replace those slaughtered during the first inspection, would amount to $858,000. This must be added to the cost of the first year's work and brings the total above $5,000,000.

The extent to which the disease may be eradicated and the time required to secure the maximum benefits are still matters for experimentation. The number of cattle which it would be necessary to slaughter, during the second, and subsequent years, cannot, for this reason, be estimated, but it may be safely admitted that it would be much smaller than during the first year.

So much for the salient points concerning the radical and arbitrary methods of procedure. It would not be surprising if

some should ask, after considering these points, whether the control of tuberculosis should be attempted. I should say in reply to such a question that an attempt of this kind should certainly be made in every State, but it appears to me that more moderate and conservative methods must be adopted in many States, than those we have just been considering. There may reasonably be differences of opinion in regard to this question, and with the facts before you each one must decide for himself and use his influence accordingly.

In a recently published bulletin on "Bovine Tuberculosis," I expressed my views as follows: "In such studies it is the farmer who is most interested. Not only does he suffer the loss of his animals from the disease, but he is among the largest consumers of meat and milk, and, consequently, the health of himself and family is proportionately endangered. The farmer must also suffer the inconvenience and the greater part of the loss resulting from the efforts for the eradication of the contagion. When these efforts are made by the State, it is a question whether this loss is not greater to the cattle owner, on account of the inconvenience of the season selected and the damaging effect of the publicity that would follow from his individual action to accomplish equally beneficial results. The time has come, therefore, for our farmers to study this question carefully and decide, in the light of the facts published for their benefit, whether it would not be preferable to themselves to free their herds from this plague, rather than to wait the necessarily slow and often unpleasant action of the constituted authorities."

What I wished to suggest by these lines is that tuberculosis in animals may be considered as primarily a farmer's question, and that the measures for its control may be directed according to the wishes and in the interests of the farmers. To successfully keep this matter in their own hands, however, the farmers must be broad and liberal in their views; they must meet the issue equally and demand such measures as will satisfy the consumer of dairy products. Any failure to do this must inevitably excite suspicion and alarm, damaging the sale of these products, and forcing the consideration of the matter as a public health question. It is scarcely necessary for me to add that all interests must yield to measures which are believed to be required for the preservation of the public health.

There can be little doubt that bovine tuberculosis will be controlled in the near future either as a farmer's measure or a public health measure. In my opinion it is not such a pressing health question that the rights and property of farmers and dairymen need be sacrificed through immediate and arbitrary action of the State. Some of our leading boards of health in their recommendations of the precautions to be taken to guard against human tuberculosis, ignore entirely the existence of bovine tuberculosis. Others go to the opposite extreme. The tendency, however, is to look upon dairy products, particularly milk, with ever increasing suspicion. This is not so much on account of accumulating evidence against these products, as it is because public attention has been attracted in this direction.

The proportion of affected cows has become more generally known. The fact that little is being done to reduce that proportion is also known. We have here the elements which a sensationalist can use at any time to start a panic.

Farmers have it in their power at this time to control the situation. This may not always be the case. Under any circumstances it is to their interest to co-operate with each other and with the authorities for the eradication of the disease. They should do this, (1) because their market is being injured through the panic of consumers; (2) because their cattle are endangered by the presence of the disease; (3) because their lives and the lives of their family may be endangered; (4) because it is their duty to take proper precautions to protect the health of those who consume their products; (5) because if farmers do not do this it will probably be done by the State and in a manner that will be both disagreeable and expensive for them.

How then can tuberculosis be controlled in a conservative manner, by co-operation between the farmer and the properly constituted State authorities? In the first place, see that there is a State authority with full power to act, and sufficient funds for the emergencies which are likely to arise. The Federal Government will supply reliable tuberculin to such State authority for official use, and with the understanding that such animals shown to be affected shall be slaughtered.

There should be employed a sufficient number of experienced veterinarians to make the tests, and also to make post-mortem examinations of all animals which have reacted after the

tuberculin injection. This work should not be extended too rapidly. Veterinarians are no more perfect than other professional men, and as this is comparatively new work, they should have time at first to watch for mistakes, to profit by them, and to learn how to guard against them as far as possible.

Begin with the known tuberculous herds, and particularly the breeding herds, which are now scattering the disease broadcast. Every owner of a large herd which has been badly affected for a considerable time, must know, or at least suspect, the existence of the disease. Let him report the facts and have the herd tested.

Let the municipal health authorities inspect the herds which are maintained within their jurisdiction, and stop the sale of milk from cows in an advanced stage of any disease, or from those which are kept under the influence of unsanitary conditions, such as filthy surroundings, impure drinking water and improper food. Tuberculosis is not by any means the only danger to which the consumer is exposed.

The owner should receive compensation for slaughtered animals He should not be treated as though he had deliberately established a public nuisance, which society has the right to abate at whatever cost to the individual. Nor is he quite in the position of the owner of a house which is blown up to stop the advance of a destructive fire. It is his misfortune that he lives in an age of progress, for he is a victim caught between the ignorance of the past and the science of the present. He has been engaged in a legitimate business, one worthy the encouragement of the State. He would have avoided the introduction of the contagion upon his premises, if he could, but the knowledge by which he could accomplish this did not exist, nor did the State protect him from the unsuspected danger.

Whether to seize and destroy affected cattle without compensation, under such conditions, is an injustice of a proper exercise of police authority, I leave for you to determine. It has been found in every part of the world, however, that the success of such work is problematical or impossible without fair compensation. When the property of any class of citizens is seized and destroyed without any remuneration being made, public sentiment soon turns against the service which demands such sacrifices; disease is concealed; affected animals are sold

and the contagion spread by their transfer ; inspection is hindered or resisted ; and appropriations for such unpopular work withheld.

While compensation is, therefore, necessary for the success of such work, every citizen should demand that it be kept within moderate limits. The tendency is to appraise animals too high, when they are purchased by the State. Men, who are perfectly upright and honest in all other transactions, will swear to an appraisement of fifty dollars on a neighbor's cow, when nobody could have induced them to pay forty for it, for their own use. This tendency needs to be guarded against, or otherwise you will find that you are protecting certain individuals in the infant industry of propagating tuberculosis, with the object of selling the affected cattle to the State authorities. If the cows were appraised at the price which they would bring in the absence of any knowledge of disease, the State should only pay two-thirds, or at most three-fourths of this appraisement. Under such an arrangement the owner gets all the cows are actually worth to him, and no one is tempted to deliberately collect sick animals, or to infect well ones, in order to patronize a remunerative market maintained by the tax payers.

In an attempt to eradicate tuberculosis from cattle we have a problem that will tax all our own resources, both financial and scientific, to the utmost. It is, therefore, the duty of those engaged in this work to avoid useless expenditures wherever possible, and it is the duty of every good citizen to sustain them in carrying out such a policy. This consideration leads me to make a recommendation which will be unpopular with some, but which is, nevertheless, just, scientific and safe, as well as economical.

The cattle which, while reacting on the tuberculin test, are in good condition and believed to be in the incipient state of the disease, should not be slaughtered in the fields and their carcasses buried ; but they should be killed in a slaughter-house under veterinary inspection. If as is frequently the case, there is only a small tubercle in one or two glands of the body, the carcass is perfectly wholesome, and should be sold for beef. The money obtained in this way would in this great State amount to a large sum, and would go far toward paying the expense of the inspection.

I know that in making this recommendation, I am opposing the sentiments and prejudices of the American people, who only need be informed that an animal is diseased, no matter to how slight an extent, to reject utterly and completely every part and particle of the carcass as unfit for human food. But, while they are so very particular when officially informed of the existence of disease, they allow the operation of slaughter houses in all parts of the country without any inspection whatever, where animals can be taken and are taken every day, and slaughtered for human food, without the least restriction, although they may be in the last stages of disease. The rule appears to be, ignorance and bliss in the presence of danger, disgust and sentimental opposition when assured of safety.

We have reached a plane of civilization where we should act according to the lights of knowledge and science. A small tubercle in one of the lymphatic glands, may affect the carcass of an animal no more than a wart upon the skin, or a broken tooth. Why destroy the carcass in one case and not in the other? As intelligent citizens, we should insist that the State should not set the example of destroying wholesome, nutritious and perfectly good food, at a time when thousands of our people are suffering because they are unable to obtain enough to satisfy their hunger.

Gentlemen, I have presented to you briefly, and without much argument, the points which appear to me to be the most worthy of consideration, in devising measures for solving the great problem which now confronts you. Each State must arrange the details of the plans to conform to local conditions and local sentiments. It is, therefore, your task, not mine, to apply the facts and general principles which have been stated, and to so organize the work as to satisfy your own citizens.

ON *DISTOMA FELINEUM* RIV. IN THE UNITED STATES AND ON THE VALUE OF MEASUREMENTS IN SPECIFIC DETERMINATIONS AMONG THE DISTOMES.

By Henry B. Ward, Ph. D.,
Zoölogical Laboratory, University of Nebraska.

A. The distomes of cats have received special attention of late in the two papers of Braun (94) and Stiles and Hassall (94). The latter authors give a most admirable account of our present knowledge of a dozen allied forms, and record two, *D. albidum* and *D. complexum* n. sp., as found in cats in the United States. During the past year I have examined[1] the cats killed at this laboratory, and have found neither of the forms recorded from the east. *Distoma felineum*, however, which Stiles and Hassall did not find, and which has not been reported hitherto for the United States, is not uncommon here. Among a dozen cats examined last spring, two contained specimens of this species, and one of the four killed this fall was likewise infected. The first cat contained over one hundred of the distomes, and the others approximately one dozen each. The exact correspondence of the forms with the figures and descriptions of Braun[2] and Stiles and Hassall leave little doubt as to the identity of the two forms, and yet there are some points of disagreement which deserve mention, especially since the discovery of the European form in the liver of man in Siberia by Winogradoff[3] adds this species to the list of human parasites.

In order to make as accurate a comparison of the measurements as possible, ten perfect and apparently average specimens were taken, stained and mounted in balsam, and the various points observed on each ; in dimensions the average of all was also noted. The forms from Lincoln are decidedly larger than the European specimens, varying in length from 12 to 20 millimetres, and averaging 14.45 millimetres, instead of being "10 to 13 millimetres" long. The oral sucker averaged in our

[1] The search was conducted under my direction by my assistant, Mr. W. C. Hall, to whom I am indebted for his trouble and for his careful work.

[2] The figure copied by Stiles (94, Pl. I, Fig. 5) "from Braun" is not in the latter's article as originally printed, but was distributed later.

[3] For an account of this discovery, which was published in Russia, see Stiles and Hassall (94, note, p. 427), and Braun (94a).

specimens 0.355 x 0.414 millimetres, and the ventral 0.247 x 0.240; thus they are not, as in the others, "of the same size (0.28 millimetres in diameter)." The pharynx was also larger, 0.212 x 0.219 millimetres, instead of 0.204 x 0.161 millimetres, and the œsophagus shorter, 0.175 millimetres, instead of 0.2 millimetres. The eggs agreed more closely with the European form, but vary from 25 x 15 to 35μ x 12μ.

Considering the general form and relation of various organs, numerous minor differences may be noted. The testes are not, in many cases, distinctly lobed, and the statement of Braun that the anterior testis has uniformly four lobes I find to be true in only seven out of ten specimens, while the five lobes said to be characteristic of the posterior testis were present in but four cases out of ten; in the other specimens the organs were either round or with the reverse number of lobes. I have compared the position of the two testes with that of the ovary and receptaculum seminis, and find the left testis to be anterior in three cases, the right in seven; in each case the receptaculum was found on the side of the body opposite the anterior testis. A comparison of the figure given here with those cited by Stiles and Hassall (94, Pl. I, 5, 6, Pl. II, 7, 8) will show other minor differences in the general appearance of organs, such as the uterus, which here almost covers the acetabulum; Laurer's canal, which is a prominent object in the specimens found in Lincoln, is not shown at all in the figures of the European form. But these are minor points.

I have reserved for consideration by itself one particular in which this form is strikingly, and so far as I can find constantly, at variance with the descriptions and figures of both Braun and Stiles. Both authors describe the vitellaria as situated in the *middle third* of the body, and composed of eight to nine groups of acini with transverse ducts from *the next to the last.* The figures bear out the statements, and show the posterior end of the vitellaria as approximately co-incident with the position of the ovary and the transverse ducts as extending posteriad from the glands toward the ovary at an angle of about 45° with the main axis of the body. In the specimens found here the conditions, as represented in the figure, are as follows: The glands begin about half as far behind the acetabulum as that is from the oral sucker, that is, at approximately the same position as in the European form, but *they extend to the middle*

of the space between the two testes, or even sometimes as far as the anterior edge of the posterior testis. One break in the line of acini may always be recognized as most prominent; it is located just opposite the ovary on each side, and is in length more or less equal to the diameter of the ovary. This is the condition shown on the left side of the worm figured. This space divides the vitellarium into two portions, which may be distinguished as antovarial and postovarial. While it is in some cases possible to distinguish in the antovarial portion groups of acini, they seem to be usually rather indistinct, or at least very unequal in size, as if adjacent groups had become confluent by the growth of interlying acini. The postovarial portion, however, is usually distinctly divided into two or three groups of acini, though even these may be obliterated. In two or three cases a small group of acini was found, on one side only, in this intermediate space opposite the ovary, and was clearly separated from both antovarial and postovarial portions by a small space. This was the case in the right vitelline gland of the worm figured.

Corresponding to the two portions of the gland one finds on each side two ducts which, extending obliquely toward the ovary from a short distance before and behind it, form a "Y" or "V" according as they meet before or not until after reaching the ovary. These ducts on either side of the ovary form one of the most characteristic appearances of the stained specimen. The differences already described do not warrant the creation of a new species for this form. At most, if shown to be constant and constantly unlike the European type, they would entitle the American form to rank as a variety. This remains for further investigation.

Distoma felineum was found in Lincoln not only in the cat, but also in the gall ducts of a young coyote, *Canis latrans* Say, which had been kept here three months as a pet, and had met an untimely fate in consequence of overfeeding.

In every case the liver of the infected animal was carefully examined, and Mr. Hall reported that the worms all lay in the dilated ducts, and that even in the case of extreme infection there could be observed neither destruction of the tissue nor other pathological changes in it, a diagnosis which I was able to confirm from a subsequent examination of parts of the affected organ. In color the living distome is a clear amber,

with the vitelline glands, testes, ovaries and the posterior portion of the uterus of a chalky white. The last-named organ changes gradually toward the anterior end until it becomes a dark chestnut brown. The worms are very transparent, and all details of structure can be made out from the living specimen with great ease, so that this species is an exceptionally good one for the study of the characters of the group.

B.—Several writers of late have emphasized the value of topographical relations in the determination of species among Trematodes and Cestodes. The prevalent method of describing a new species in both groups may be said to be the mathematical; when, for a distome, *e. g.*, the author has enumerated the relative size of the two suckers, and their actual diameter, supplemented by a few data on length and breadth of the worm, size of the ova, etc., taken perhaps from a single specimen, the description is complete and the new species is duly baptized. This method, which may be fairly said to be a survival of the antique Rudolphi-Diesing regime, still prevails to an unfortunate extent in some quarters and especially in our own country. Often these details of measurement are given with great care even to the micron, while the topography of the body is either passed over with a few general words or at best only sparsely treated. In opposition to this I would urge that the *topographical relations alone are fixed*, and hence *the only points on which species may be founded*. It is against the apparent and deceptive accuracy of such mathematical descriptions and in favor of a fuller and more complete treatment of topography that I would present a few arguments drawn from actual cases.

The untrustworthy character of measurements alone is easily shown by my article (Ward, 94), on *Distoma Westermanni* in the United States; the specimens found at Ann Arbor disagreed with the published measurements of *Distoma Westermanni* in every particular: size of worm, of the suckers, and of the eggs; and the differences were so great that average of the Ann Arbor specimens surpassed the extremes given by Leuckart (89). Not only this but the oral sucker was decidedly larger than the ventral which is exactly the contrary of the case in Asiatic form. In spite of these apparent differences the Ann Arbor species was undoubtedly *Distoma Westermanni* as I was

able to say after comparing stained specimens and sections with the splendid description of that form given by Leuckart. Last fall this species was found in a shepherd dog near Columbus, O., and at my request specimens kindly sent me for study. A detailed report of the case has already been published (Ward, 95), and a comparison of the measurements given there show still more strongly the variability of these parts. The worms were larger even than the Ann Arbor specimens as were all organs measured, but the relative size of oral and ventral suckers shows this time agreement with the description of the Asiatic form given by Leuckart.

Not only do specimens of the same species thus obtained from different localities differ in these respects but those from the same locality and even from the same host vary almost as widely. Among the specimens of *Distoma felineum* mentioned above I was able to observe this fact. In some few the oral and ventral suckers were alike in size as is the case in the European form according to Braun ; in others the oral was somewhat larger and in the extreme case nearly twice as large as the ventral. Furthermore the measurements differ considerably accordingly as they are made from the living specimens or from those preserved and mounted, the oral sucker being in the living animal in one or two cases twice as large as in the mounted specimens. On purely *a priori* grounds one would expect this since the parts measured are highly muscular and may be in a state of relaxation or of contraction at the particular time of measurement. Specimens which are preserved when fresh and active invariably show smaller figures in size of the worm and of its parts than those which are kept some time in salt solution for study and fixed when almost if not fully relaxed. I have endeavored by drawing curves and calculating to determine for these specimens whether there was shown any relation between the length and breadth of the animal and the size of the suckers and pharynx, that is, whether these organs might be modified by the extension or contraction of the body ; but so far as I can see the variations in the size of these organs seem to be entirely independent of the body as a whole.

By examining the figures given above for *Distoma felineum* it will be seen that the suckers are not circular and the difference in the individual cases was even larger than the average

since one-third of the specimens contradicted the average. Unless both diameters are given another element of uncertainty is introduced.

It is clear, then, that these characters may vary both by chance and in consequence of the treatment employed or the time at which the measurements are made and that the figures possess at best only an apparent accuracy. Since then they are so variable they cannot even be regarded as convenient secondary characters for the determination of species. Of course no one would claim that a sub-division of the Distomidæ according to the relative size of the suckers was a natural classification, but the instances cited, to which many others might be added, show that it is misleading and should be discarded entirely. It is, however, just this method of dividing the group which is used in many keys not only in textbooks but also in works which are regarded as more exact.

Even if these data were sufficiently accurate to be used as secondary characters in determination it is none the less true that they are *secondary*, and that they have been preferred to the primary relations of organs and systems on which alone any natural classification of the group must rest. The preponderance of such mathematical data and the absence of anatomical descriptions have resulted in the confusion of different species and in the re-naming of well-known forms. This is nowhere better illustrated than in the article of Braun (94) or in the recent splendid monograph of Looss (94) on the distomes of frogs and fishes.

In connection with the mathematical descriptions, already sufficiently characterized, figures are often published which merely give the approximate position of the organs by circles or ovals without any indication of their ducts or connections. Thus Stiles and Hassall (94, p. 420) were unable to determine from many figures whether the anterior or the posterior testis belonged to the right side of the body. As Braun has said (93, p. 909) a solution of the genus *Distoma* on the basis of a single system is impossible. It is then equally true that this much desired solution must wait for the abandonment of the mathematical ideal and the substitution of topographical study. Much has been done in this direction by certain authors already cited, but I am convinced that the old method will persist in certain places until the issue is fairly met, and until no species

is accepted and regarded as established for which the author has failed to describe at least its general topographical anatomy or to publish a figure showing the same.

Ventral view of *Distoma felineum* from the liver of a cat killed in Lincoln, Neb. (For this drawing I am indebted to Miss Anna Fossler.)

I have endeavored to show:

1. That the characters ordinarily employed in systematic descriptions of the Distomidæ are very variable.

2. That the mathematical data usually given have an *apparent* accuracy which is responsible (*a*) for much confusion and (*b*) for the neglect of anatomical studies.

3. That these data are not even reliable for use as secondary specific characters.

4. That a solution of the group is possible only on topographical grounds.

5. That no new species should be accepted without a description, or a figure, giving the topographical anatomy of the form.

Lincoln, Neb., December, 1894.

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THE TREATMENT OF PNEUMONIA.*

By Arthur Salinger, V. M. D.,
Demonstrator of Surgery, Veterinary Department, University of Pennsylvania.

The article upon the treatment of bronchitis and pneumonia by H. R. Macaulay, V. S., in the above number of the Veterinary Magazine, has interested the writer very much on account of the many practical suggestions contained therein. We must, however, take exception to some of the points in the treatment and pathology of pneumonia contained in this article.

Dr. Macaulay makes a statement that broncho-pneumonia is by far the most frequent form of pneumonia encountered in veterinary practice. He says, "We do not meet with the acute (lobar) and interstitial forms of pneumonia." This is obviously incorrect, as according to many authors (Dieckerhoff, Froehner and Friedberger and others) lobar pneumonia is more frequent in horses than any other form met with. We must judge, then, that the rules of treatment laid down by Dr. Macaulay are for broncho (catarrhal pneumonia).

To quote from Dr. Macaulay's article, "The pathological changes occurring in all these pneumonias are very similar, the chief differences being that in the lobar form usually but one lung is affected. Consolidation of the lower lobe is a prominent symptom early in the disease, and there is but little expectoration, while in broncho-pneumonia the disease develops more slowly and is accompanied by some marked bronchial symptoms."

According to modern pathology it is impossible to consider together two such dissimilar diseases as acute lobar (croupous pneumonia), and broncho- or catarrhal pneumonia.

Lobar pneumonia is considered and is essentially an infectious disease depending upon the development of a special pathogenic microbe, the pneumococcus of Fraenkel, Friedlander, Weickselbaum and others. Broncho-pneumonia is always a secondary disease following a preceding bronchitis and extending by continuity of structure from the larger

* A reply to an article by H. R. Maculay, V. S., in the issue of the Veterinary Magazine of December, 1894.

bronchial tubes into the finer bronchi. While it is true that many micro-organisms have been found in broncho-pneumonia, no special pathogenic germ has been found constantly present.

Croupous pneumonia, all pathologists agree, is divided into the three distinct stages consisting in congestion, red hepatization and grey hepatization. The disease begins by an outpouring of an inflammatory exudate into the alveolar structure of the lung. Broncho-pneumonia, on the other hand, begins as a preceding bronchitis and only secondarily affecting the finer bronchi and part of the alveolar structure. Obviously then, in the question of treatment, we must consider whether we are dealing with acute lobar pneumonia or bronchial pneumonia. No hard and fast rules can be laid down in either case. Taking it for granted then that the article in question refers to broncho-pneumonia, we cannot admit that there is such a pathological condition as a congestive stage. This congestive stage evidently has reference to the first stage of croupous pneumonia; we all know that the primary stage of every inflammation is a short stage of congestion followed by stasis of blood in the capillaries, veins and small arteries. It is true that this condition does exist in the first stage of lobar, croupous pneumonia, in which condition we have at the same time a full, strong bounding pulse. Where can the possible indication be for digitalis so strongly urged by Dr. Macaulay in this condition? We can easily see, that if the heart be weak, the pulse small and feeble, digitalis may be indicated; but how is it possible to lay down strict rules for treatment in every case. We know who Professor Petrosco of Europe is "who uses digitalis and this only in all pneumonias with a mortality of only 1.22 per cent." It is quite evident that the Professor only comes in contact with very mild pneumonias, or is mistaken in his diagnosis, as all authors give mortalities of at least 20 per cent. Professor Osler, in his work on "Practice of Medicine," gives a mortality of 20.4 per cent. In the Charity Hospital of New Orleans, out of 3969 cases, the mortality was 28.01 per cent. In Pepper's System of Medicine, in the article on croupous pneumonia, by Alfred L. Loomis, the mortality is given in the Vienna hospitals as 24 per cent. In the Basle Hospital the report for a period of thirty-two years gives 23 per cent. The Bellevue Hospital reports for a period of four years 34 per cent. In private practice the lowest percentage of cases, 205 in

number, given by Lebert, is 7.3 per cent. It seems evident, then, that Professor Petrosco's statistics must be taken *Cum grano salis*. In the administration of digitalis its accumulative action must not be forgotten, and if it is administered in large doses, as advised by Dr. Macaulay, the heart may be arrested in systole. We doubt whether digitalis has any power to prevent the deposition of fibrinous material, to prevent or check the migration of white blood corpuscles to the inflamed parts and to arrest the multiplication of cellular elements. That it may be useful to combat some of the symptoms, high temperature, low tension of the vessels, etc., is admitted by all. Another point to which we desire to call attention is the fact that digitalis readily disorders the healthy stomach, how much more so the enfeebled digestive apparatus of a horse affected with pneumonia. We would advise against the indiscriminate use in *all* cases and administer only for special fixed indications. We freely admit all that has been said about whisky and the use of alcoholic stimulants so practically put forth by Dr. Macaulay. We cannot, however, agree to the so called "Abscess of fixation treatment." Pneumonia is an acute, infectious, systemic disease and how an abscess, artificially produced in another part of the body, can prevent or ameliorate the pathological changes of croupous pneumonia, we cannot see. This is a system of treatment which has never even been practiced in human medicine to any great extent.

Bleeding in young robust horses early in the case may frequently be followed by good results; it should, however, not be practiced in the later stage of the disease.

Dr. Macaulay does not believe in the application of blisters, but if you do not believe in applying blisters, why do you believe in producing an abscess.

Many cases of pneumonia will recover without special medication—we might say, in spite of some medication. There is no specific treatment for pneumonia, each case must be treated upon its own merits. No two cases are alike, no two cases present the same symptoms. The treatment must be a purely expectant, symptomatic one.

STRINGHALT.

By Dr. S. J. J. Harger,
Professor of Veterinary Anatomy and Zoötechnics, University of Pennsylvania.

It is not my intention to demonstrate in this paper the true pathology of this abnormal condition, for more careful observation is necessary before arriving at a definite conclusion. Here, let us remember that, as in many other cases of incorrect nomenclature, stringhalt, the "dry spavin" (*éparvin sec* of the French) is only a symptom of diverse diseased processes. The pathology of the disease or diseases with which this symptom is associated is not constant, and observation seems to demonstrate that there are a number of lesions in various parts of the member accompanied by altered muscular contractions which cannot be attributed exclusively to any one particular alteration. Hence, if we wish to study the pathology, it is, I believe, necessary to study a number of diseased processes. In support of this view, we have not only post-mortem dissections, but the variation in the group of muscles affected, and the results of different methods of treatment; a treatment successful in one case may be negative in another.

The muscles affected are generally the flexors or the extensors in the different regions of the member. In some cases, extension of the femur, flexion of the tibia and an excessive elevation of the point of the hock are most marked, without any exaggerated alteration in the canon movements; in others, there is excessive flexion of the femur and the canon, with an elevation of the stifle. On account of the anatomical disposition of the flexor of the metatarsus, flexion of the femur cannot take place without a corresponding movement of canon, although the latter seems in many cases relatively greater than the former. Abductive movements are infrequent. Each individual case offers a different physiological mechanism.

I will give a resumé of the various theories and the treatment of the defect, to be followed by a report of a case on which I operated with success. It was this latter fact which induced me to write this article.

Stringhalt is designated *idiopathic* when it cannot be assigned to any particular cause, and *symptomatic* or *mechanical* when it accompanies a definite lesion or a mechanical interference with locomotion.

Among these conditions, I may mention pain in some portion of the member (symptomatic), curb, shortening of the facia lata aponeurosis, spavin, a very straight hock, excessive development of the ridge on the lower articular surface of the tibia, shortening of the lateral extensor of the phalanges, chronic inflammation of the sciatic nerve. Goubaux observed chronic arthritis of the coxo-femoral joint. Pain in the foot under certain conditions acts as a cause. Cadiot made section successively of the digital and the sciatic nerves; in six days the spasmodic movement had disappeared, but fifteen days later the foot sloughed off. The hoof showed a keraphocele. Beyond this, I am not prepared to speak on the foot-theory of springhalt. A hypodermic injection of cocoaine over the plantar nerves will eliminate or affirm the location of the cause in the foot. Again, in incipient spavin, before the exostosis is developed, a jerking movement of the hock may accompany the lameness. Undoubtedly, in many cases, such lesions are coincidents, while the true cause is not discovered.

Rousseau[1], a French army veterinarian, is of the opinion, after a number of observations, that the spinal cord is the seat of the lesion. He performed plantar and sciatic neurectomy to exclude the lower portion of the member, which did not influence the movements. Double stringhalt, arching of the back, tucked up flank and sensitive loins yielding readily to the pressure of the hand, difficulty and exaggeration of the movements in turning, lead him to locate the trouble in the lumbar region of the spinal cord. He made one autopsy and found an abundance of arachnoid fluid, a yellowish coloration of the inferior (motor) nerve roots, while the superior were white, and some vascular congestion. The member otherwise was normal.

This theory will best explain many of the different phenomena observed and the variations in the muscular regions affected. The nerves emanating from the lumbo-sacral plexus originate in different parts of the spinal cord, and hence the

[1]Rec. de Med. Vet., November, 1894.

altered muscular contraction in any given case may vary according to the portion of the cord affected. Comparing the flexors and the extensors, the altered movements may be developed under two conditions; excessive contraction of the flexors, or a loss of coördination between the flexors and the extensors. The first proposition explains itself. As to the second, during locomotion, the contraction of the flexors and extensors follow successively and harmoniously, first the one set and then the other. If this harmony is disturbed, and one set contracts before the other has ceased, the movements become antagonistic and irregular. Thus, if the flexors commence to contract before the extensor force is expended, the flexors must contract with additional force to overcome the latter, and thus impart a jerking movement to the leg. There is, as it were, an antagonism between the extending and flexing forces. This will furnish a plausible explanation for the fact that the spasmodic contractions will disappear with exercise, or become cured spontaneously after prolonged rest. Opposed to this, however, is the fact that the symptom sometimes disappears after a certain treatment influencing a region other than the central nervous system.

Comény's theory is that stringhalt is due to an excessive dryness of the hock joint from an insufficient synovial fluid. The dryness of the articulation, he claims, can be recognized on the exterior by the adherence of the skin to the surface of the bones; the skin is less movable; the fluctuation of the saphena vein less distinct; the skin on the outer and the inner side of the hock separated only by a thin layer of connective tissue, and in severe cases almost in contact with each other. He claims to have found this peculiarity in several hundred horses. It is more marked in severe cases, and can be best seen by comparing the hock with that of the other leg, or, in double stringhalt, with those of another horse. I have never been able to observe this conformation of the hock in such cases, the dryness of the articular surfaces and the increased friction explain, according to him, the "scraped" appearance of the articular pulley of the astragalus; an extra and spasmodic contraction being necessary to overcome the resistance, which imparts a jerking motion to the foot. This is not yet confirmed by other observations. Comény ascribes the diminished synovial secretion, in a far-fetched manner, to alterations

in the spinal cord. He recommends as a verification of his view an intra-articular injection of egg-albumen, which should give temporary relief; exercise increases the synovial fluid, and hence improvement after exercise.

A too straight hock (too open in front), open angles of the member, sometimes give the movements a spasmodic character. This can be seen in the dissected hock-joint in which the flexion as well as the extension after reaching a certain point are completed with a "snap" or jerk.

Boccar, Dieckerhoff and Bassi called attention to the elasticity of the tibial aponeurosis and have by its section cured a number of cases. For several reasons I am inclined to the belief that this may act as a mechanical cause, acting like an India-rubber band extending from the stifle to the canon. (1) Dissections show that these aponeuroses contain yellow elastic fibres and appear elastic; (2) section of the aponeuroses has given relief as well as cured some few cases. In one case of double stringhalt much relief followed section of the aponeurosis and the lateral extensor in one member, while severing the anterior tibial nerve on the opposite member gave no relief, showing that the difference was not due to section of the lateral extensor tendon. This elastic apparatus comprises more than tibial aponeurosis. It consists of a complete superficial envelope extending from the thigh to the canon. In the thigh we find internally the crural aponeurosis, in front the fascia lata, outwardly the gluteal aponeurosis; these are continuous below with the superficial layer of the tibial aponeurosis, which has a special termination in the form of a *triangular slip*, below the tarsus, on the anterior tendon in the bend of the hock.

As to treatment, cauterization of the loins as well as electricity are unsuccessful.

I have in a few cases tried anterior tibial neurectomy, but always with negative results. Dr. J. C. Meyer reported a successful case of tibial aponeurectomy after section of the anterior tibial nerve was negative.

Dr. H. H. Choate, of Lewiston, Me., and myself operated upon a most severe case of double stringhalt; in one member the tibial aponeurosis and lateral extensor were cut. A marked improvement followed and progressed until the animal was destroyed six weeks afterwards. In the other leg, the anterior tibial nerve was cut, with no improvement.

Tenotomy of the lateral extensor without section of the aponeuresis, in my experience, has little influence upon the gait, either in stringhalt or in the normal leg.

A case was recently brought to my clinic at the university hospital, which I will report in detail.

The subject, a draft horse, weighing about 1400 pounds, had a history of falling down an embankment a year ago, but had been affected with stringhalt prior to that time. The symptoms were most severe, rendering the animal *absolutely useless.* Walking was very difficult, and trotting was of the hop-skip-and-jump order. It was with the greatest difficulty that the horse was made to walk, the feet seemed as if pinned to the ground. Before starting on a walk the leg was forcibly flexed, the hoof touching the flank, and maintained there for some seconds. The canons and pasterns were covered with scars from cuts of the opposite foot. In turning, the body pivoted on the hind feet.

The operation was performed January 26, in the following manner; The patient being cast, a side-line was placed around the leg above the hock and one at the lower end of the canon. After the usual antiseptic routine, the skin was punctured two inches below the tarsus and over the tendon of the lateral extensor of the phalanges, care being taken not to injure the collateral artery of the canon. A long tenotome then being inserted, was passed toward the inner side between the skin and the triangular termination of the aponeurosis; the edge of the instrument was then turned toward the bone and the section completed by drawing it outward with some pressure, the side-lines being pulled in opposite directions to straighten the leg. The instrument was next passed between the tendon and the canon bone, from behind to before, and the tendon cut upwards. The separated ends of the aponeurosis and the tendon can be felt through the skin when the section is complete. After getting up there was no perceptible improvement. Some amelioration was noticed the next day, which continued steadily for a week, when the spasmodic movements were not much noticeable, and the animal practically was ready for work.

At the present time the horse is practically cured. There is nothing abnormal in walking; trotting is regular, the action perhaps a trifle high. It is only in making a short turn that

the flexion of the hock is a little exaggerated, but the animal is as serviceable as before. I have operated on several other cases, but unfortunately the animals were destroyed before the result could be determined. In one dissection in which the spinal cord was not examined, nothing abnormal was found, excepting, as I thought, numerous elastic fibres in the above-mentioned aponeurosis covering the muscles; the synovia of the hock joint was abundant, and the articular surfaces were not scraped but showed a few spots of ulceration. In this case section of the lateral extensor tendon had no effect; the tibial aponeurosis was not cut.

To recapitulate, the spinal and the mechanical elastic theories, it appears to me, include the majority of these cases.

CROUPOUS PNEUMONIA IN THE HORSE.*

By Arthur Salinger, V. M. D.
Demonstrator of Surgery, Veterinary Department University of Pennsylvania.

It is the object of this paper to call attention to the pathology, diagnosis and treatment of acute lobar pneumonia.

The consideration of croupous pneumonia is by no means new; a discussion of some of the more important symptoms and newer remedial agents in the face of recent investigations is, however, in place.

The *synonyms* for this disease are Lobar, Croupous or Fibrinous pneumonia, Pneumonitis and Lung Fever:

Pneumonia is one of the most widespread of all acute infectious diseases. There is scarcely an acute infectious disease so frequent in the horse as pneumonia. Climate does not seem to have much influence in the production of this disease, it prevailing equally in cold and in hot countries. Cold has been thought to be one of the most important etiological factors, and it is undoubtedly true that the disease sometimes follows a sudden chilling or wetting, but in many cases it will be impossible to obtain any such history. Pneumonia frequently follows traumatisms of the chest, when it is known as "contusion pneumonia."

* Read before the Pennsylvania State Veterinary Medical Association, March 6, 1895.

A change of opinion has recently taken place since the development of bacteriology in regard to the etiology of croupous pneumonia. It is now unquestionably considered an infectious disease depending upon a specific micro-organism. What has furthermore given strength to this opinion among the medical fraternity is the fact that many epidemics of pneumonia have been described.

The diplococcus pneumoniæ of Fraenkel is the most constant organism found in croupous pneumonia and it is now believed by the most competent authorities to be the specific agent of this disease. It is identical with the micrococcus which Pasteur and Sternberg found in the saliva of certain individuals and which produces septicaemia in the rabbit. The researches of Friedlaender, Wickselbaum and others show that it is by far the most constant organism in pneumonia. According to the dominant view pneumonia is an infectious disease caused by this diplococcus which has its main seat and produces its chief effect on the lung and can under favorable circumstances invade the pleura, meninges and endocardium. It is a widespread organism, at times present in the buccal secretions of healthy animals; in the secretions of the nose and mouth it may be demonstrated by treating the ordinary cover glass preparation with glacial acetic acid, and then washing off the acid, dropping on aniline oil and gentian violet, which is to be poured off and renewed two or three times. The organism is seen to be a somewhat elliptical, lanced-shaped coccus occurring in pairs, hence the term diplococcus. It is usually encapsulated. Inoculation experiments upon dogs, guinea pigs and mice have proven successful, the germ producing the well known pathological changes occurring in croupous pneumonia.

Morbid Anatomy.—Since the time of Lannaec pathologists have divided the stages of pneumonia into three well known divisions of *engorgement*, *red hepatization* and *grey hepatization*.

1. The stage of engorgement usually lasts but a short time —from twelve to thirty-six hours. The lung tissue is deep red in color, more solid and on sections of the surface is bathed in blood and serum. Crepitation is still present, although not so marked as in normal lung.

2. In the stage of red hepatization the lung tissue is firm, solid and airless. On section the surface is dry, reddish-brown in color and the deeply congested appearance of the first stage

is absent. In this stage the lung is very friable and is readily broken by the finger. Careful inspection shows the surface to be distinctly granular and the air cells filled with fibrinous plugs. The smaller bronchi often contain fibrinous plugs. This stage usually lasts about two days.

3. Stage of grey hepatization is the first stage in the process of resolution. The exudate is softened, the cell elements are disintegrated and are rendered capable of absorption. The grayish appearance is due to the absorption of the haemoglobin and red blood corpuscles, with an increase in the number of white corpuscles. A point to which especial attention should be called is the almost frequent association of affection of the pleura. It can be stated that in every case of pneumonia where the inflammatory process reaches the periphery, the pleura is affected.

The pleurisy may be either a dry one (pleuritis sicca) or a pleurisy with effusion may be present. We will have occasion again to refer to pleurisy with effusion in considering the symptomatology and prognosis of croupous pneumonia. It will be noticed that the right lung is more frequently affected than the left one.

Symptoms.—This disease usually begins with a marked and prolonged chill with rapidly rising temperature, frequently going from 103 to 106 degrees, with rapid pulse, marked depression, hebetude and anarexia. The extremities will be found to be cold. The pulse may be from 60 to 100 in a minute. In severe cases the conjunctiva may be seen to be jaundiced, due to profound blood alterations. Symptoms referable to the lungs manifest themselves at once. Respiratory movements are quickened and painful, due in the majority of cases to early involvement of the pleura. The type of breathing is costal. The affected animal does not lie down or if found in the recumbent position, the animal will lie upon the affected side. The standing position of the horse is typical. The front legs are usually held far apart and the head is extended and carried low. The animal moves as quietly as possible, cautiously preventing unnecessary movements. Cough if present is slight, short and evidently painful. The most important diagnostic points are brought out by physical examination.

Percussion early in the first stage may give you a tympanitic note. This can only be observed if the case be seen early.

This tympanitic note soon gives way to dullness on percussion which shows the beginning of the stage of red hepatization or consolidation. In the third stage the percussion note tends toward clearing up and in favorable cases returns to normal pulmonary resonance. If the pleura be affected, slight percussion over the affected area produces sharp pain.

On auscultation in the first stage we hear an increase of the respiratory murmur, accompanied by crepitant râles. This râle is heard only at the end of inspiration. As consolidation goes on the crepitant râle disappears, giving place to bronchial breathing. In the stage of resolution, moist râles return, which are coarser than the râles first heard and are known as the "crepitus redux."

If pleurisy with effusion take place at any stage of the disease, the respiratory symptoms will become aggravated. The dyspnoea already present will be changed to orthoponoea. Symptoms of cyanosis will begin to show themselves. It is obvious that if you have fluid at the base of a lung that is already affected by an inflammation of high grade, the difficulty in breathing will become more marked. Hence the recognition of pleurisy with effusion (no matter how slight the effusion) should be noticed at once.

The urine has the characteristics of ordinary febrile urine, high specific gravity and usually alkaline in reaction. Albumin may be present and the chlorides will be found to be markedly diminished.

The fever is typical, remaining high from the onset, with very slight morning remissions. It remains so for five to six days and in favorable cases declines, recovery usually taking place in from ten to fourteen days. The termination is usually abrupt, resembling crisis. The cough becomes looser, the respirations less rapid, the pulse slower and fuller. The animal regains its appetite and shows all the symptoms of returning health.

In rare cases the disease may be arrested in the stage of red hepatization; in these abortive cases the disease may last only two to three days.

In fatal cases, especially of the typhoid variety, symptoms of general blood dissolution manifest themselves. Oedema of the lungs sets in and death due to heart failure comes on.

The *prognosis* of croupous pneumonia is favorable in a large majority of cases; unfavorable cases are those presenting the

typhoid state and those in which complications develop, especially pleurisy with effusion.

The termination may be either complete resolution, delayed resolution, chronic interstitial pneumonia (which occurs either in very young or very old animals, those debilitated by some previously existing disease as bronchitis), abscess and gangrene of the lungs—the latter terminations are rare.

Diagnosis.—Croupous pneumonia can be readily diagnosed from catarrhal pneumonia by its clinical course. The sudden onset, the high fever, the physical signs, the termination are all essentially different. The course of catarrhal pneumonia is atypical, you have a history of a preceding bronchitis or a toxic agent inhaled, or food particles getting into the air passages, (deglutition or inhalation pneumonia).

Catarrhal pneumonia is a double-sided disease and the spots of dullness on percussion will be found to be small, difficult to make out, and affect only a lobule of the lung. The râles do not disappear in catarrhal pneumonia, but remain throughout the disease, nor is the breathing distinctly bronchial. In catarrhal pneumonia we have subcrepitant râles heard both on in and expiration, whereas in croupous pneumonia we hear a moist râle only at the end of inspiration.

The diagnosis from pleurisy can frequently not be made, as I have already indicated that both fibrinous and pleurisy with effusions are concomitant with this disease. In typical cases the history of the disease, the onset, the fever, the cough and the physical signs will enable one to come to a correct conclusion. In questionable cases the bacteriological examination of the secretions from the nose and mouth will show the presence of the diplococcus of Fraenkel.

There is no specific treatment for pneumonia, the recent experiments by the brothers Klemperer, of Berlin, on the production of immunity and for the cure of pneumonia with subcutaneous and intra venous injections of large quantities of filtered boullion cultures or the glycerine extract of the germ, has produced some remarkable results. Immunity lasting for six months was produced in animals and was transmitted to the offspring born within this period. Still more interesting are their observations upon the cure of the experimentally produced disease. They found that the serum and fluids of the body of an animal which had been rendered immune had the

property not only of producing immunity when introduced into the circulation of another susceptible animal, but actually of curing the disease after infection had been in progress for some time. In infected animals with a body temperature of from 40 to 41 degrees C., the fever fell to normal in twenty-four hours after the injection of serum of another animal which possessed immunity. They believe that the pneumococcus produces a poisonous albumin (pneumotoxin), which when introduced into the circulation of an animal causes elevation of temperature and the subsequent production in the body of a substance (anti-pneumotoxin) which possesses the power of neutralizing the poisonous albumin which is formed by the bacteria.

In man they hold that during the pneumonia process there is a constant absorption into the circulation of this poisonous albumin produced by the bacteria in the lungs. This continues until eventually the same antidotal substance is produced in the circulation that has been seen to occur experimentally. It is then that the crisis occurs. The bacteria are neither destroyed nor is their power to produce the poisonous albumin lessened, but the third factor, the anti-toxic element, now exists and neutralizes the toxic substances as they are produced. They demonstrate that the serum of the blood of patients after the crisis of pneumonia contained the anti-toxic substance and was capable, in a fair number of cases, of curing the disease when injected into the infected animals.

While these experiments are still immature, they are, nevertheless, a decided advance in therapeutics and seem to approach as near as possible to a specific plan of treatment. Further experiments in this line will be awaited with interest by the entire profession.

We know, then, from our present knowledge, what are the main indications for treatment in this disease: *First*, the hygienic surroundings and food of the patient should be carefully looked after. The animal should have an unlimited supply of fresh, cold water from the start. A diet consisting principally of bran mashes, scalded oats (grass, when in season, is preferable if the animal retains an appetite), but if no desire is evinced for food of this particular description, then the animal must be allowed to eat anything that will be taken spontaneously. Corn on the cob is often eaten when everything else is refused. If the horse absolutely refuses to eat it has

been found to be good practice to feed him with oat meal (preferably Bethlehem oat meal) and eggs three or four times daily, made into boluses and given in this manner. The comfort and surroundings of the patient must be attended to. Pure air is essential. Avoid placing the animal in a stall where he may be exposed to draughts of cold air and sudden changes of temperature. It is considered better practice to blanket the animal than to cut off the fresh air and prevent thorough ventilation.

Local applications of mustard, turpentine, etc., have been found useful. In regard to blood-letting it may be briefly stated that as a system in croupous pneumonia it should not be resorted to. In young, strong animals, of good stock, if the case be seen early, and *only* early, local blood-letting has some decided advantages, but in older, more feeble animals and those affected by some chronic ailments (bronchitis, emphysema) it should never be practiced. A symptom that often requires special treatment is the high fever. This may be treated either locally or constitutionally. Of the local measures, systematic applications of cold water to the chest will be found useful. Another plan is to give large enemata of cold water by the bowel. This will promptly reduce temperature without depressing the heart, and should be used every couple of hours until the temperature is lowered. Experience advises against the use of the analgesic, antipyretics, such as antipyrin, antifebrin, phenacetin, etc., on account of the too depressant effect upon the heart. To add the depressing effect of a powerful drug to the pathological influences already depressing the heart, is now recognized as increasing the danger of cardiac failure which is the most frequent cause of death in croupous pneumonia.

While it is true that these drugs unquestionably reduce temperature, they do it at a great risk, and while we have other means of lowering temperature (cold water applications and enteroclysis of cold water) they should not be employed. If any of these drugs be given, phenacetine should be chosen, as it has the least depressant effect upon the heart. The employment of veratrum viride and aconite in the first stage, and digitalis at a later period, appears unreasonable. Cardiac depressants in croupous pneumonia are always of doubtful utility and digitalis as a cardiac stimulant should be given only in

response to special indications. Many of the symptoms of pneumonia are due to a toxaemia and it is far better to bleed the patient, if he is to be bled at all, into a basin than into his own vessels. Later in pneumonia, when the heart becomes weak, digitalis and alcohol are of decided value. Stimulating expectorants during the third stage have some use; the one having the widest reputation and being by far the most used is the carbonate of ammonia. If employed, the dose should be frequently repeated, as the effect of this drug is soon lost. A powerful respiratory stimulant, when such becomes necessary, is strychnia. This should be administered hypodermically and in full doses. If the cough becomes distressing and painful, resource should be had to opium in some form, preferably as Dover's powder. A favorite plan of treatment in human practice consists in giving full doses of quinine early in the disease, followed by a laxative dose of calomel; reduction of temperature if it becomes necessary, carbonate of ammonia as a cardiac and respiratory stimulant, control of the fever by means that have already been indicated, digitalis and alcohol if the heart shows signs of flagging and the treatment of complications as they may arise.

The disease being the same whether it affects man or animal, it seems to me that the same treatment might well be practiced in veterinary medicine.

It must not be forgotten that many cases of pneumonia will recover without treatment (and also in spite of bad treatment) and the less we complicate our case by giving unnecessary drugs the clearer will be the course and the symptoms of the disease.

THE ETIOLOGY OF PERIODICAL OPHTHALMIA.*

By Prof. Paul Fischer,
State University, Columbus, O.

In spite of the recent revelations as to the nature of this disease, the labors expended to discover its cause are not yet final. According to modern ideas, there can hardly exist a doubt that the causes at the bottom of this malady are of an

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infectious nature, but the slightest clue to the nature of this infectious material, as well as the manner of its invasion, has not yet been obtained.

Vigezzi, Koch, Richter, Trinchera and others have found and described various forms of bacteria in the eyes of horses that showed the characteristic symptoms of moon-blindness. In some cases these organisms have been thought to be the cause of the disease, but nothing has been proved conclusively. Attempts have also been made to produce the disease in healthy animals by direct inoculation of the aqueous humor of a diseased eye into a healthy eye, but the results were all negative. Similar experiments with rabbits proved nothing.

Investigations by Willach have led to studies in a different direction. Willach examined thirty-seven diseased eyes belonging to twenty-four different horses, and revealed a number of interesting conditions. The majority of the eyes examined presented unmistakable symptoms of periodical ophthalmia. Some were recent; others were of longer standing.

In five eyes belonging to four different horses, numerous round worms were found, in part in the liquefied vitreous body, in part in the flaky masses of exudate. One of these cases was a colt, born blind, and killed when two weeks old. These parasites were 0.095–0.125 mm. long and 0.0075–0.012 mm. wide, and were provided with mouth and digestive tract. Willach regards them as a species of rhabditis, and calls them *rhabditis oculi equini.* In one case a young filaria was found in the eye. In another case cyst-like formations were observed, the walls of which were studded with numerous roundish bodies and sickle-shaped hooks; some of them formed daughter cysts. Willach regards this as an early stage of tapeworm, and calls it *cysticercus oculi equini.*

In twelve eyes the diseased parts (lens, vitreous body, etc.) contained the lower forms of a distoma, resembling those that are found as tubercle-like masses in the muscles of cattle, and lungs and liver of horses. In one case the same parasite was found in the eye, liver, and cerebellar choroid plexus of the same animal. In the lung and in the liver these organisms attain the size of a pea, and hence we can readily see that they can do considerable harm when in the eye.

Willach supposes these parasites to pass into the eye through the vascular system, and in rare cases also from the meninges

of the brain to the eyes. In order to give his theory more support, Willach supposes that in those eyes in which no parasites were found the latter were already destroyed. He further claims that these microscopic entozoa were found in all recent cases. That such parasites can be absorbed is known from the fact that this actually takes place with large filaria papillosæ. Willach explains the infection to take place through the medium of the food and drinking water. This is supported by the enzootic appearance of the disease in certain regions with a clay subsoil. According to the views of Willach and the results of his labors, the sire of a colt can have nothing to do with the transmission of the disease, but an infection from the dam can take place in intra-uterine life, thus explaining its occurrence in young colts. Willach thinks that the infection proceeds from the intestine or some other organ, through the blood-vessels, and finally through the hyaloid artery. This theory is also in unison with the fact that digestive disorders often precede periodical ophthalmia. Whether the periodical character of the disease is due to periodical immigrations of the organisms into the eye, or whether it is due to certain movements that these entozoa make from time to time, Willach does not attempt to decide. After all this, the nature of the infectious principle is still somewhat obscure, but the presence of an infecting principle as the cause of the disease can hardly be doubted.

Clinical observations not only support this supposition, they even show that certain conditions are necessary for the development of these infectious principles. In France the first observations of this character were made. The two studs, Limousin and Pompadour, which were established in France in the beginning of the eighteenth century, suffered heavy losses from this disease. In Limousin the colts were attacked when from six to nine months old, provided they remained in that region. If they were immediately removed (as soon as weaned) to the Franchè Comtè, they were not troubled. The same state of affairs prevailed and was observed in Pompadour. The French Government ordered investigations to be made; these, however, developed no conclusive results, except that the disease was limited to certain localities.

In Spain it was observed that the disease was in intimate relation with external conditions. In Bouin a certain pasture was

fertilized with sewage. The grass grew luxuriantly, and nearly all horses that pastured there for a few months were attacked with the disease. The disease also occurred after a flooding of the damp bottoms of the Guadalquiver in Sevilla. According to Gromow, this disease now and then assumes an enzootic character in the swampy lowlands of Russia ; and during damp seasons the disease is more common than in dry ones.

In Germany the disease is most common in the eastern and western borders of the empire, in spite of the fact that horses from Eastern Prussia are the most common in the whole country (Möller). This shows that no one particular breed is at fault. In 1811 periodical ophthalmia appeared as an epizootic in Sarthe, Germany, after floods. It also occurs in the valleys and lowlands, while the highlands are usually unmolested.

The stud at Hof Gaismar, near Cassel, Germany, is also one of those in which the disease is common ; it is said, however, to have been perfectly free from the disease until horses from other regions had been added. The cavalry regiment of Frankfurt was transferred to Hof Gaismar, and from this time on the disease appeared in said regiment. These facts, and many others that could be cited, are clear evidence that the disease depends on local conditions. Clay subsoils, and especially river bottoms, are considered dangerous.

It is also probable that the infecting organisms are on the food. In Lothringen the farmers are so firm in this opinion that they sell all the fodder they raise and buy from other regions for their own use. When the cavalry regiments stationed at Saarburg, St. Avold and other places ceased using fodder from suspicious districts, the attacks ceased.

According to Reich, the number of attacks in the Russian military horses increased when barley was substituted for oats. The barley may, in this case, have been the carrier of the contagion. Hugues observed an outbreak in a regiment, which ceased as soon as they stopped feeding mouldy oats.

Professor Bayer, in his excellent work on "Surgery," states: "Periodical ophthalmia probably occurs in horses of every breed, although Stockfleth claims that Danish horses are free from it. A fact is that in some regions the disease is almost unknown, while in others it is common to an alarming extent." According to Zündel, at Nied, near Frankfurt-on-the-Main, 59 per cent of the horses kept on lowlands suffer from this

disease. In the higher regions 32 per cent are affected. On clay soil, 40 per cent; on limestone soil, only 6 per cent. In the western part of France, fifty years ago, the number of affected animals ranged from 25 to 30 per cent, but since that country has been thoroughly drained the figures have dropped down to 5 per cent. For the same reason the figures given for Strassbourg have fallen from *18* per cent down to *2* per cent; in Schlettstedt, from 75 to 4 per cent.

In France and in Elsass observations have been made which support the theory that the foodstuffs take an active part in the production of periodical ophthalmia. This was the appearance of a peculiar affection of the mucous membranes of the digestive and respiratory tracts, attended with icterus, and continuing eight to ten days. Three or four months later most horses thus affected have an attack of periodical ophthalmia.

Professor Möller states: "It is still a question whether the invasion attends this disease of the mucous membranes, or whether the disease simply prepares the host for the invasion." As long as the nature of the infection is unknown, we can, of course, form theories only. Then again, whether the eye is affected directly, or whether the infection takes place through the medium of the circulation, is also still unsettled.

The sudden appearance of the disease in the uveal tract speaks for the blood as the medium of infection. The cornea and sclera are not adapted to permit infection from without.

The transmissibility from one animal to another is admitted by some and disputed by others. In spite of the numerous and careful records kept in Germany, it was never recorded that one horse infected another.

So much, however, is definitely known, viz.: a clay subsoil and damp regions and seasons are favorable to its development. For the same reason damp and dark stables, although they may not be the direct cause, certainly favor the development of the disease. The disease is always more frequent in low and damp regions and after floods. In Russia the swampy regions are more commonly infected than the higher and dryer ones.

The course of periodical ophthalmia as compared with that of other infectious diseases presents some peculiarities, viz., its periodical character; but, on the other hand, do we not meet with the same thing in malaria and recurrent typhus? And nobody doubts their parasitic nature.

The question of heredity is still unsolved. Nearly all observers state that a *predisposition* to the disease is certainly hereditary.

Turk-Mayn-Atly, the Oriental stud horse imported into the Prussian studs at the close of the last century, is said to have done considerable damage in the way of transmitting the disease. The same is said, and seems to be true, of the well-known American Lexington. But in spite of these apparent and weighty facts, if we admit an infectious principle to be at the bottom of the disease, many of the facts alluded to in favor of heredity lose their value—*e. g.*, the frequent occurrence of the disease in certain families. Since the members of one family are, as a rule, exposed to the same external conditions, we cannot accept this as conclusive without other data. Single cases, where a colt has been born blind when both parents suffered with moon-blindness, prove nothing.

The question of heredity is still open to dispute. Even if we admit that an infectious principle is the sole cause of the disease, the influence of heredity is not excluded. We know positively the cause at the bottom of tuberculosis, and at the same time we know that not only the predisposition, but in rare cases also the actual disease is transmitted from parent to offspring.

Koch and others claim to have definitely observed that moon-blind stallions have transmitted the disease to the first and second generations. Didieux claims exactly the reverse. He says that in France nobody hesitates to buy from infected districts, and that moon-blind mares are preferably used for breeding purposes, *because they are cheaper and just as good as any others.* Hek reports three blind mares that had twenty-five colts in twelve years, and none of these colts ever went blind. A farmer had six mares covered by a moon-blind horse; four of the resulting colts were observed by Didieux for a period of nine years, and never became blind.

Of 100 colts from another blind stallion, some of the mares also being blind, none suffered in a period of observation of nine years. More cases similar to these are given by Professor Möller in his "Augenheilkunde."

From what has thus far been stated, it seems to be evident that if anything is transmitted or inherited, it is a *tendency to get the disease*, but not the disease itself. In order to discover just what influence heredity on the one hand and infection on

the other hand have in producing the disease, will require long and continued careful observations in the future.

Sex seems to have no influence as far as tendency to the disease is concerned. Age, on the other hand, has. Most practitioners agree that animals three to four years old are most frequently attacked, although no age is exempt. The fact that three- and four-year-olds are the most common sufferers probably explains the fact that dentition was formerly accused as the cause (irritation of the trigeminus). In want of better knowledge, almost anything was formerly accused, viz., catching cold, ill-ventilated stables, irregular feeding, too much fodder, feeding corn to colts, over work, disturbance of circulation, etc. Chabert accused the pressure of the harness on the cervical arteries. That any or all of these circumstances tend to injure the animal's general health, and thus predispose them to any disease, cannot be denied, but none of them can to-day be considered as the direct cause.

The fact that young animals are more inclined to become affected than old ones favors the theory of infection. That the disease attacks animals in poor health in preference to those in good health needs no explanation.

The character of the inflammation in the uveal tract points to the probability that an infection is the cause. But whether one specific micro-organism or several kinds, alone or together, produce the disease cannot as yet be decided. The regular course of the disease makes it seem probable that one specific micro-organism is at the bottom of the cause.

Etiologically, periodical ophthalmia of horses must be regarded as a specific disease, which, as such, occurs in horses only. Periodically appearing eye diseases, with symptoms resembling those of periodical ophthalmia, also occur in other animals; but regions in which the disease is especially frequent in horses are not especially rich in cases of periodical eye diseases in other animals. In coming to a conclusion, we may say that the etiology of periodical ophthalmia has up to the present time found no satisfactory explanation.

DISEASES OF THE EYE.*

By Dr. W. R. Howe.

In the practice of human medicine, ophthalmic practice is left almost entirely to the specialist, and it is well that it is so, for in most medical colleges the student gets but a very meagre idea of that branch of practice, and even if he gets more, it is a science by itself. No man who attends to a general practice can become so proficient as the man who make this a specialty. I have endeavored to make somewhat of a study of this subject, and will now consider some of the diseases of the cornea.

The cornea is the clear, transparent anterior portion of the eye-ball. It is the first and most important part of the dioptric apparatus from the fact that all impressions must pass through it first; hence, without a nearly perfect cornea you can never have good sight. Any opacity, or the least change in the convexity, must be an impediment. Though the cornea is not thick, its tissues are exceedingly firm and resisting, and will stand a great deal of abuse without injury; it also has the peculiar property of allowing fluids to penetrate it, thus allowing medicines to act on the deeper tissues. The cornea is composed of several layers, the number of which vary with the ability of the anatomist to separate them. The usual division is into an epithelial layer, an elastic lamina (known as Bowman's membrane), the cornea tissue proper, followed by another elastic membrane called Descimet's membrane, and lastly by another epithelial layer. The superficial layer is continuous with the epithelial layer of the conjunctiva.

The blood-vessels of the cornea are derived from the anterior ciliary artery. They do not pass into the cornea, as this would diminish its transparency, but simply enter the periphery and anastomose. The nerves, being transparent, are found all over the cornea. These are mostly from the anterior ciliary nerves.

The slightest inflammatory action in the cornea shows itself by an increase of cells. These may be round or spiral shaped, and are called wandering or lymph cells. They are identical with white blood corpuscles, and come from the marginal blood-vessels. The result of inflammatory action in the cornea

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must be infiltration. This infiltration may or may not be sufficient to cause a breaking down. If circumscribed, the superficial layers will suffer; if deeper, and the external epithelial layer is not altered, the infiltrated portion becomes thick by a deposit of serum. In this case it becomes more or less diffused. Again, the infiltrated cells may accumulate at a certain place to such an extent as to interfere with nutrition. This may then break down, forming a cavity filled with pus cells, and an abscess be the result, the contents of which may be absorbed and not leave an opacity. In other cases the pus cells may gravitate between the elastic membranes. This shows itself by a white opacity known as onyx. Again, the pus cells will find their way through the membrane of Descimet into the anterior chamber. This is known as hypopiom or pus in the anterior chamber. The two conditions of onyx and hypopiom resemble each other somewhat, but can easily be distinguished by an oblique examination. In case of an onyx, the anterior chamber is clear, while in case of a hypopiom it is full of pus in its lower portion. Again, in case of hypopiom, the pus will move if the position of the head is changed, while in onyx the opacity is stationary. The upper line of an hypopiom is level, while in an onyx it is convex. Frequently in horses we find a break in the continuity of the cornea. An abscess then becomes an ulcer. This may be circumscribed, or, as is more common, it may extend superficially or it may extend in depth even to the perforation of the entire cornea. If superficial, it may heal without leaving any opacity; but if deep, it is most sure to leave an opacity except in a very young animal. The healing process necessitates the formation of new blood-vessels in the cornea, but they soon disappear after the wound is healed. If the ulcer perforates, the aqueous humor escapes; the iris is then apt to fall forward and unite with the cornea. This is called an anterior synichia. Before the cornea is perforated the strong membrane of Descimet, in resisting the intra-ocular pressure, may bulge outward. This is known as a keratocele. The process of repair may now set in, but the eye is more likely to rupture, or, at least, the deeper portion will most likely become affected and form a dense opacity known as leucoma, and if the iris is attached it is then known as leucoma adherens.

Treatment.—In the treatment of inflammatory processes of the cornea we must avoid all irritating remedies, such as nitrate

of silver, sulphate of copper, etc., furnish good hygienic surroundings, and darken the stall, and rest the patient. A three or four grain solution of atropine should be dropped into the eye three or four times a day to overcome congestion, dilate the pupil, and thus prevent adhesion ; at the same time use hot fomentations. Poultices are not sufficient, but hot water may be applied with a pad for not less than one hour at a time, and applied twice or three times a day. Traumatic keratitis, or inflammation of the cornea, is comparatively common in the horse. A clean cut heals very quickly, but burns or an abrasion are apt to result in an opacity. A foreign body, such as an oat hull, is often found imbedded in the cornea, with a greatly thickened opacity surrounding it. This should be removed at once by first cocaining the eye, then introducing a speculum, or having an assistant hold the lids open with retractors. One of the best instruments I know of, if the foreign body is not too well imbedded, is the clean end of a match or piece of pine wood chewed to a brush. This with gentle pressure will often dislodge it ; but if this will not do, take a cataract needle, introduce it well under the body and raise it from the cornea. Great care must be taken not to go too deep. The ordinary treatment follows.

Burns of the cornea either from chemicals or cinders are perhaps the worst injuries we have to treat. If done by acid, it should be neutralized by a mild alkali. If by an alkali, this should be neutralized by a mild acid, of which perhaps lemon juice is the best. In this case it is well to dissolve atropine in olive oil, two grains to the dram of oil. To this you may add three or four grains of cocaine.

Acute suppurative keratitis, or ulceration of the cornea, is the worst form of corneal disease we have to contend with. Usually when called to see a case, we find the animal standing in the darkest corner he can find, head down, pulse accelerated, a generally worn and dejected appearance, the eye closed and often hard to open, eyelids more or less swollen, extreme lachrymation and photophobia. On opening the eye, the entire conjunctival membrane is found to be swollen and injected to such an extent as frequently to lead to the belief that the real disease is in the lids. Usually the ulcer is soon found, but it may be necessary to cocaine the eye, and, if in a horse, to apply a twitch before you can make a satisfactory examination. You

will find the ulcer, which may be superficial and covering considerable surface or may be deep and circumscribed, best by an oblique examination. The ulcer may be white, or covered with yellow spots, thickened at the periphery, with an indentation in the centre, or if the ulceration is superficial and of considerable extent, the denuded surface may be bulging from intra-ocular pressure.

At this stage we are most likely to find hypopiom to a greater or less extent. A very small ulcer may perforate the cornea, the aqueous humor escaping, and the iris protruding; then heal, making, as before said, an anterior synichia, or if a greater portion of the cornea is diseased, it will bulge and rupture from intra-ocular pressure. A superficial ulcer always allows of a more favorable prognosis than a deep one. You may have quite a large hypopiom and it absorb as readily as it came, or it may penetrate Descimet's membrane and filter between the membranes. This will produce a large, permanent opacity, if it does not cause a large breaking down of the tissues and ruin the eye.

Another danger which we have to contend with is the implication of the iris. In this case, on oblique examination, it will be found to be thickened and curling, of a dull color, the eye more painful and perhaps some accumulation of pus. This condition is usually controlled unless the cornea is too badly affected to allow the medicine to enter. Hypopiom of any standing, especially when the iris is implicated, will often extend to the lens, leaving a cataract.

Another danger is a staphyloma, a white bulging growth on the cornea. It often protrudes through the lids. As to *treatment* it is varied and hard to apply in the horse, but sufficiently successful even in the horse to make it interesting if applied judiciously. It consists principally of hot water, atropia, antiseptics—of which the actual cautery is a prominent one—and the knife. Hot water is always indicated; it lessens pain, dilates the blood-vessels and carries off inflammatory products as well as the congested blood, and in that way relieves the intra-ocular pressure, which is always present and one of the greatest dangers. It should be applied with several thicknesses of cloth fastened to the halter, kept wet and as hot as the patient can stand for an hour at a time; remove while still hot,

wipe off the water, and apply a dry warm woolen cloth for twenty to thirty minutes, to prevent reaction.

Atropia reduces the inflammation. It readily penetrates the cornea, relieves pain and dilates the pupil by contracting the iris, thus preventing adhesions. About a four grain to the ounce solution is preferable. In mild cases a few applications will often clear up the entire opacity.

Before other treatment the cornea should be cleansed by dropping on it a 50 per cent solution of peroxide of hydrogen; if you use the Oakland brand, you may use it full strength. This will thoroughly cleanse the ulcer for treatment. After reducing the inflammation, if the ulcer does not heal readily, you may use iodoform, or yellow oxide of mercury, ten grains to the ounce of vaseline. This should be rubbed down exceedingly fine. After the acute symptoms have subsided, you may make an ointment thus:

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Hydrarg. oxidi flav. . . . . grs. x.
Atropinæ sulph. . . . . grs. v.
Petrolati . . . . . ℥j
M. ft. ungt.

If this does not answer, you may double the amount of mercury, or you may add a little cocaine to relieve the pain. In applying an ointment, great care is necessary. After thoroughly cleansing the eye, a small amount should be laid on a probe or small glass rod; with the eye opened, the palm of the right hand lying on the head, draw the probe or rod over the eye, at the same time closing the lids to wipe the ointment off the rod and on the eye. The same care in regard to laying the hand on the head should be taken in using the ordinary eye-dropper. But in all bad ulcers that do not respond to this treatment, you must rely on the actual cautery; in fact, if you are so situated that you can use it, it is a preferable treatment in most all bad cases of ulceration. It must be applied by a very fine platinum wire, heated by electricity. Before attempting to use it, the eye should be well cocained; in fact, this is best for applying most any treatment to the eye. Gently touch all the ulcerated surfaces, using the ordinary precaution of laying the operating hand on the head. If the patient be very nervous and you are a novice in the use of the cautery, it will be best to allow an assistant to

hold the eye-ball with fixation forceps. In that case, be careful to grasp the conjunctiva at or near the corneal margin. While this is a delicate operation, there is no treatment equal to it, for it stimulates healthy action in an ulcer better than any other known remedy, and can be repeated as often as necessary. It is a good plan to apply a little grease or even dress with a mild yellow oxide ointment, to which you may add a little cocaine after cauterizing.

When you have a hypopiom that does not disappear or decrease with the ordinary treatment, or in any case where there is danger of a rupture of the cornea from any cause, especially intra-ocular pressure, it is advisable to make a paracentesis to evacuate the pus and relieve the intra-ocular pressure. If done with proper care this operation is not dangerous. To make the operation you may first cast and secure the animal, but I do not consider this necessary in the majority of cases. It is best to thoroughly dilate the pupil with atropine. When this is done, take the horse into a good light, twitch, cocaine the eye well, introduce the speculum or retractors, and fix the eye-ball with fixation forceps. After this preparation is complete, take the spud or keratome, select a spot at the lower part and near corneal sclerotic junction, lay the hand on the head as in writing, hold the knife as a pen and push upward, firmly but gently. The cornea cuts hard. Force the knife upward and backward in an oblique manner, taking great care not to touch the iris. After passing the knife in full length, draw it partly out and raise it up to allow the pus to escape. If the pus is stringy and clogs the opening, you may use a small pair of iris forceps to pull it out, or a small probe.

In case of a deep ulcer with bulging of the deeper membrane of the cornea and not much pus in the anterior chamber, you may operate at the seat of disease; right in the centre of the ulcer is the better place. In this case a small opening will be sufficient. A cataract needle is the best instrument; or, in case you prefer a larger opening, to which there is no objection, you may use the cataract knife, introducing it near the marginal line a little forward of the centre and cutting outward and backward. This plan is preferred by some. The great point in either operation is not to wound the iris. The after-treatment consists first in cleansing the eye with peroxide of hydrogen or warm water. Apply a few drops of a two-grain to the

ounce solution of eserine, close the lids, apply a clean piece of linen or antiseptic gauze, and cover by a pad of absorbent cotton, retained by a good pressure bandage. For this purpose a flannel bandage is generally preferable, except in very warm weather. This should be removed twice a day, the eye cleansed and eserine applied until there is a good cicatrix, not forgetting to use good antiseptic measures in all cases.

The greatest danger after the central operation is from the staphyloma. This can generally be prevented by the free use of eserine. If an opacity remain after the wound has healed, go back to atropine with an occasional application of yellow oxide ointment, about twenty grains to the ounce. So long as small blood vessels can be seen around the opacity, absorption is going on, but if after three months all blood vessels have disappeared and an opacity still remains, your case is not likely to end favorably. As a last resort, the operation of iridectomy may be performed. This operation is very successful in human practice. While not so suitable in the horse, it can often be made to good advantage.

ANTISEPTIC SURGERY.*

By Dr. H. A. Spencer.

Mr. President and Gentlemen:

For several years I have been deeply interested in trying to fathom the mystery of the most humane and expeditious method of treating surgical and accidental wounds. A number of years ago our journals fairly teemed with the successful results of antiseptic surgery, but the technique was either too poorly described or rendered unavailing by the demands for extensive and expensive paraphernalia, that I, after many crude attempts abandoned it, with the firm conviction that it had its origin in the vagaries of some visionary theorists, and was entirely impracticable in ordinary practice; therefore, I would be content to follow the time-honored custom of our fathers and welcome the appearance of laudable pus.

* Paper read before the California State Veterinary Medical Association, March 13, 1895.

But a friendly intercourse with a number of medical gentlemen, who were firm adherents to modern surgery, finally led to numerous invitations, which were eagerly accepted, to attend surgical operations where the antiseptic and aseptic methods were employed in the most minute detail; and, gentlemen, the revelation was made plain to me that my former attempts had been not anti-, but candidly pro-septic surgery.

That the study of bacteriology has been productive of some of the most startling discoveries as to the cause of disease, is readily conceded by all students of medicine. Among the most brilliant results of these investigations, none have been more gratifying to the progressive practitioner than the perfecting of a methodical and scientific manner of conducting surgical operations with a view to complete asepsis.

We are accustomed to hear operators, who have gleaned some theoretical knowledge of bacteriology from the casual perusal of our literature, or from the lectures of their college professors, discourse learnedly on the dangers of wound infection, and the various methods to prevent such disaster; but where we witness their attempts, we find them fully as inconsistent and abortive as the crude attempts that I made in the same line in my early efforts to emulate the successes of those scientists, who related their providential achievements in the columns of the journals, but forgot the importance of giving their readers a lucid description of the details that blended inseparably perfect the *modus operandi*.

It is patent that a surgeon who would wear the laurels of a successful operator in modern surgery should have a keen conception of the relative meaning of the terms sepsis, asepsis and antisepsis, and a fixed determination to use the knowledge in its strictest sense in his surgical practice, for the omission of a single detail, however minute in the performance of an aseptic or antiseptic operation, will in the majority of instances be the means of introducing infectious material into the wound. It is to be also remembered that the sins of commission are frequently as fertile a product of evil as those of omission; therefore, he must not depart from the minutiæ of the rules laid down for his guidance.

Aseptic is a word derived from the Greek, and is defined as, not liable to putrefaction; but surgically it means something more than this, as our hands, apparel and instruments are not

liable to putrefaction, or at least are only remotely so, while unless they have been sterilized and are kept sterile, they are not aseptic, but are mediums whereby we may convey the most disastrous infections to the wound. Therefore, by aseptic we mean a condition in which there is complete absence of infectious or septic material, or in other words, excluding from the seat of operation, and from our hands and those of our assistants, from our instruments, sponges, dressings, or any material we may select to use in our operations, all micro-organisms of a pathogenic nature.

And, though we may have observed with scrupulous care all the details for complète asepsis, still it is very likely that fresh wounds may contain organisms that are either numerically too few or are non-virulent, and hence do not give rise to infection. Indeed, no method has yet been discovered by which the skin can be rendered absolutely sterile, and there are micro-organisms in cutaneous glands that the most thorough disinfecting fails to remove, and these in a suitable soil are capable of producing inflammation and suppuration ; therefore, it is patent that we should be as thorough as possible, for if these bacteria should be of a virulent character and the patient of an anæmic nature, the tissues, fluids and cells would not exercise that germicidal power they are ordinarily endowed with, and infection would undoubtly occur. In short, if we have not had at least an elementary training in bacteriology, we should unswervingly follow the detailed instructions of those whose researches in that field of science have made them proficient tutors to guide and direct us.

To those who thoroughly understand the phenomena that produces suppuration in wounds and general septic conditions, they are not a source of wonderment. To them it is only remarkable that these conditions do not exist more frequently. Hence, I say, that no matter how sound an anatomist nor how skillful an operator you may be, unless you practice in detail the rules of asepsis, when it is possible—which unfortunately for us of the veterinary persuasion is not as frequent as we would wish—you will fall out of the procession of advancement that modern surgery is making.

The terms sepsis and septic—as has been indicated—includes all, or nearly all the general or local surgical infections caused by bacterial invasion. The chemical products of bacteria are

more the cause of the disorder than they are themselves; several varieties of micro-organisms when they gain entrance to the general circulation multiply, and then a general blood infection is the result, which frequently proves fatal. With or without extensive multiplication of micro-organisms in the blood, the system may be overwhelmed with bacterial poisons. This condition is known as acute septicæmia. Localization of pyogenic bacteria in the organs, especially when they have been transported by emboli, gives rise to multiple abscesses, and is called pyæmia, and when both conditions co-exist it is called septic-pyæmia.

Under the head of local infections, are grouped together all those accidents which befall wounds—suppuration, traumatic fever, hospital gangrene wound, diphtheria and erysipelas.

Antisepsis.—In the employment of antisepsis, we use the best means that can be devised for destroying the bacteria that exist, both in the wound and on the implements that shall come in contact with a wound; and here it is proper to state that the terms antiseptic and disinfectant should not be confounded. The latter relates to those agents which destroy pathogenic or putrefactive organisms and are germicides. While antiseptics only arrest putrefaction and fermentation, but do not necessarily kill the micro-organisms. A deodorizer does away with stench, but may not have either antiseptic or disinfectant properties.

While bacteriologists have shown us that infection rarely takes place from the air, they have also demonstrated that it is most frequently brought about by contact, thus we are enabled to understand the importance of preventing the introduction of bacteria on instruments or the hands of the operator and assistants.

The association of laboratory with operative clinical experience should continue, and we cannot forego advising the expediency of the surgeon and bacteriologist laboring together in a field that promises so much for the instruction of both, when the results of their investigations are brought into comparison.

But our enthusiasm for aseptic methods should not allow us to lose sight of the necessity of perfect mechanical modes of procedure. In the matter of technique, aseptic operations call for no inconsiderable preparation. First, the operating table should be sheltered and occupy a reasonably clean room, all instruments should be subjected to a thorough cleansing and

be placed in boiling sterilized water, after which they should be distributed in convenient trays or shallow pans which should contain a sufficient amount of carbolized hot water to keep them submerged. Several gallons of sterilized water should be placed in a large fountain syringe, preferably made of metal to admit of its sterilization. A quantity of towels and enough loose smocks or apons for the operator and his assistants should be prepared by boiling in a solution of 1 to 1000 of bichloride of mercury, and afterwards dried and subjected to a heat of 212 degrees in an oven, when they may be carefully wrapped up until needed; sponges should be made, not be purchased. They may be made by taking pieces of antiseptic gauze and placing wads of antiseptic cotton in their centre and tying them together, thus forming a very cheap and convenient absorbent. There should be an abundance of these, and after having been subjected to heat of the oven, they should be packed away in sterilized wide-mouthed fruit jars.

A large piece of rubber or oil-cloth should be sterilized to be used between the field of operation and the table. The patient should be prepared for the operation by an assistant, who should see that the part immediately adjacent to the seat of operation is shaved and thoroughly scrubbed with first clean hot water, soap and brush, and then thoroughly rinsed by some antiseptic fluid from the fountain syringe, after which this part must be left untouched, except with sterilized hands. The patient may now be placed upon the table and anæsthetized while the operator and his assistants are preparing their hands. This should be done in the following manner: First, a thorough scrubbing with hot water and soap, then a rinse in a carbolic solution, then in a strong solution of permanganate of potash, then in a solution of oxalic acid and a final douche from the fountain syringe, after which they may be dried by wiping them on one of the sterilized towels.

From then on, those concerned must be impressed with the fact that they are to touch absolutely nothing that is unsterilized, wiping off perspiration, blowing the nose, scratching the face, or putting the hands in the pockets must be strictly forbidden.

The assistants are then assigned to their individual duties, one to manage the nozzle of the fountain syringe, one to hand sponges and instruments, one to sterilize instruments that have

been used and are dirty, and one to see that the sterilized towels completely surround the field of operation, that the operator's hands and instruments may not come in contact with non-sterilized objects. The instruments, sponges, dressings, basin for rinsing hands, fountain syringe, etc., being now placed in convenient situations by some of the assistants, the surgeon and his assistants should be helped into their smocks, and the operation may be proceeded with. And, gentlemen, if you will follow these details, and finally cleanse your wound of all clots and debris, and then make your wound impervious to the air with a thoroughly antiseptic dressing, you will have an antiseptic wound, and it will never require but the one dressing, for it will heal without stench, swelling or suppuration, and there will never be an appreciable elevation of temperature.

CLINICAL REPORT.

RABIES IN THE HORSE. *

By G. W. Butler, V. S.,
Circleville, Ohio.

Case I.—A bay mare belonging to Mr. Trimble, of Rockaway county, Ohio, was bitten on the nose by a strange dog while being driven on the road to a buggy on or about September 25, 1894. This dog was soon afterward killed. Its history was not known. Before it was killed, however, it bit several other dogs in the same neighborhood, and nearly all of these dogs were immediately destroyed. One however, was spared, and about six weeks later it manifested symptoms indicative of rabies and was killed by its owner. The symptoms, as described to me, were general stiffness and shyness, and attempts to bite other animals with which it came in contact. The mare above alluded to appeared well (the wound healing rapidly) until October 29, 1894, when she was noticed to make frequent attempts to urinate, manifest a certain degree of restlessness, and to rub the nose where she had been bitten. Next day, October 30, the owner drove her to town and I was asked to examine her, and found her showing following symptoms.

Very nervous, frequent attempts to urinate, general spasmodic contraction of the superficial muscles, more especially those of the nose, almost constant moving of the ears forwards and backwards ; pupils dilated, the eyes would squint now and then, and almost constant rubbing of the nose where bitten, the skin at that part having been destroyed by the rubbing. Did not take pulse or temperature, but noticed respirations were increased during periods of excitement. Ordered mare to be put into a box-stall where she could be closely watched, and did not give any medicine. She would eat a little hay now and then ; also a little corn, and drink a little water during

* Read before the Ohio State Veterinary Medical Association, January 15, 1895.

the twenty-four hours of her confinement in the stall. The symptoms gradually increased in severity until the spasms were sufficiently severe to render the mare unable to stand. Occasionally she would draw up her neck as if she were choked, but such attitude was only maintained for a few seconds, when she would again assume the more natural position. Moving her ears and rubbing her nose were kept up or continued all the time, and as she grew worse she began to bite her forelegs and side, and during the paroxysms would squeal with pain. She also would lick and bite the manger and things that were given her. At no time was there any marked secretion of saliva, nor did she appear very furious, although being confined as she was, the opportunities for displaying such inclination were not very great.

At one time when the owner, assisted by another man, attempted to administer a dose of medicine, after it had been discharged from the case the mare attempted to bite the assistant, and the excitement brought about by this attempt to give her a drench, caused her to fall down. On the third day after the first symptoms had been noticed, her condition was such that it was thought prudent, even by her owner, to destroy her, and the city marshal consummated the act with his revolver. No post-mortem examination was made.

Case II.—A mare, four years old, the property of Emanuel Wollever, living near Circleville, O., while being driven to a wagon with another horse, gathering sweet corn on the nineteenth of September, 1894, was attacked by a strange dog and bitten on the nose, so that the skin was lacerated. On the nineteenth of December following, the mare did not appear altogether right, but next morning she was hitched to a wagon with another horse and used to haul a load of fodder out of the field, during which time she fell or laid down two or three times. Upon being taken into the stable soon after, she made attempts to bite other horses. Upon my arrival a short time afterward, the following symptoms were observed: Superficial muscles contracting spasmodically; the ears were almost constantly moved forward and backward; the hips were continually twitching, and every few minutes the whole muscular system appeared to undergo a spasmodic contraction, and the mare would at these times lie down, but would rise again in a few seconds, and would begin eating the food that was before her.

Occasionally she would rub the nose against the manger. Being suspicious of rabies I ordered the mare kept by herself, and asked to be informed of her condition in the evening. At that time the owner reported that she had grown steadily worse; the symptoms having become so aggravated that she was rubbing the nose and biting the manger, and becoming violent. I did not visit her, but requested to be apprised of her condition next morning; but she died that night about 10 o'clock, becoming terribly violent before death. Toward the last the spasms would cause her to squeal, and when water was offered her she would put her lips to it, when she would be seized by a spasm. So violent did she become that she broke up the mangers badly in the stable she was in. Next morning about 10 o'clock I made an examination of the body. The abdomen was greatly distended with gas. The intestines appeared healthy externally. The mucous membrane lining the cæcum and large colon contained a few strongulus tetracanthi, and that of the former was somewhat congested. The stomach was full of food, and normal in appearance. Mucous membrane lining larynx and trachea was inflamed and covered with ecchymosed spots, as was also that lining the bronchial tubes. The lungs were congested, and their surface presented numerous ecchymosed spots. Could not detect much amiss in the brain, except that it appeared less dense than normal, and I thought the membranes were somewhat congested at the base of the organ. Other organs appeared normal. Do not know the history of the dog that bit the mare, nor what became of it.

PROCEEDINGS OF SOCIETIES.

KEYSTONE VETERINARY MEDICAL ASSOCIATION.

The monthly meeting of the Keystone Veterinary Medical Association was called to order by President Lintz, at the office of Dr. W. H. Hoskins, No. 3452 Ludlow street, Philadelphia, Tuesday evening, February 12, when the following members answered roll-call: Drs. Bridge, Eves, Hoskins, Lintz, McAnulty, McClellan and Rhoads. Visitors present being Drs. J. T. Fairly and J. O. George.

Dr. Hoskins, as chairman of the Legislative Committee, gave a concise history of the movements and present position of the bills now before the legislature, in which veterinarians should be interested, viz.: to establish a LIVE STOCK SANITARY COMMISSION in the State.

Dr. Edge's bill and the one known as the veterinarian's bill, being modified and blended, are now one bill and known as House Bill No. 24.

There is a bill to establish an office of State Veterinarian on the State Board of Agriculture.

And another introduced by Mr. Harvey to prevent the docking of horses' tails.

The application of Dr. Pearson for membership was referred to the Board of Censors.

The essayist being absent, cases were next reported.

Dr. Bridge said the supposed cases of contagious pleuro-pneumonia reported at Chester Heights and Danville were only bronchial troubles.

He also reported a case of tetanus in a cow from acute peritonitis, and a case of a Jersey cow from puncture wound of the foot by a nail.

Dr. Hoskins reported a recovery from tetanus in three weeks with bromide of potassium treatment

Dr. Eaves thinks if puncture wounds of the foot were immediately soaked in creoline solution, tetanus would be prevented.

Dr. Lintz exhibited a clamp used in fracture of the infra- or supra-maxillary bone.

W. L. RHOADS,
Secretary.

The March meeting of the Keystone Veterinary Medical Association was called to order by President Lintz, at the office of Dr. W. H. Hoskins, 3452 Ludlow street, on the 12th inst.

The following members were present: Drs. Bridge, Eves, Goentner, Hoskins, Hart, Lintz, Rhoads and McAnulty, Dr. Allen visiting the meeting.

Dr. Hoskins, as chairman of the Legislative Committee, reported the bill to place a veterinarian officially on the State Board of Agriculture to have passed both Houses, and now needs but the Governor's signature to become a law.

The bill to establish a State Board of Veterinary Examiners is in the same position it was a month ago, and now stands a poor show of being heard from again this season.

The Veterinarians' Examining Board of Ohio meets April 2, when Dr. Hoskins expects to attend, having been invited to be present.

After this report, the qualifications of the known applicants for State Veterinarian, under the new law, were thoroughly considered and discussed.

It was urged that at this particular time a man should be selected who was particularly well fitted and naturally adapted for this work, that the people might learn to repose a greater confidence in the profession.

On motion, the President appointed Hoskins, Bridge and Hart as a committee to select from the known applicants the one they thought best fitted to honor and advance the profession as State Veterinarian.

This committee, after due deliberation, selected Dr. Leonard Pearson as the man best qualified and adapted for this work.

The Board of Censors were instructed to look for a larger meeting room, as the attendance made more room essential.

The board was also instructed so consider the advisability of reducing annual dues and attend to a revision and printing of the Association's By-Laws.

The Board of Censors now reported having favorably considered the application of Dr. Leonard Pearson for membership, and he was elected by unanimous vote.

Dr. Goentner reported a very interesting case of pernicious anemia in a running stallion.

The reading of papers was postponed, as the time was taken up with discussion. Meeting adjourned to meet at the home of Dr. Kooker, April 9.

W. L. Rhoads,
Secretary.

CALIFORNIA STATE VETERINARY MEDICAL ASSOCIATION.

San José, Cal., March 13, 1895.

On the above date the California State Veterinary Medical Association held its regular quarterly meeting, at the St. James Hotel, San José, Cal.

The president, Dr. C. B. Orvis, called the meeting to order at 3 p. m.

Upon roll call, the following members were found to be present: Drs. Orvis, Spencer, Sr., Spencer, Jr., Egan, Forrest, Sr., Forrest, Jr., Wadams, Schodde, Shaw, Skaife, Fabbi and Archibald. Visitor, Prof. A. A. Cunningham.

Letters of regret were read from Drs. Pierce and Maclay.

There not being a quorum of the Board of Examiners present, the Chair appointed the Secretary to act on the board in conjunction with the two members of the board that were present. A recess was declared in order to allow the board to consider applications for membership. Upon the meeting reconvening, the Secretary submitted the following report:

Mr. President and Gentlemen:—Your Board of Examiners having had under consideration the applications of Drs. J. R. Shaw, A. B. Wise, J. A. Edmons. J. J. Streets, B. W. Schodde, J. W. O'Rourke, E. J. Creeley, S. A. Withers and

R. J. Withers, respectfully recommend that they be elected to membership; also, having had under consideration the applications of O. C. Baldy and J. Trullinger, we recommend that they be rejected.

Signed by Drs. Spencer, Sr., Egan and Archibald.

On motion, duly seconded, the report was received and placed on file.

The Committee on Legislation was then called upon to report. Owing, however, to the absence of the chairman, Dr. Spencer, Sr., gave a partial report, which was completed by the Secretary. The report was accepted and the committee discharged. In this connection, Dr. Spencer, Sr., made a few remarks regarding the support given the Committee on Legislation by the members of the Association. He stated that the failure on the part of the committee to obtain the passage of Assembly Bill No. 210 was entirely due to the lack of interest taken in the matter by the members. The Secretary also made a few remarks on this subject, in which he stated that it was impossible for one or two members of the Association to obtain any legislation alone. He also stated that where a Legislator had been interviewed by a Veterinarian from his district, he invariably proved a friend to any bill introduced by the profession.

Under the head of application for membership, the Secretary presented the name of C. L. Megowan. Referred to the Board of Examiners.

Under the head of admission of new members, the following gentlemen were elected: Drs. J. R. Shaw, A. B. Wise, J. A. Edmons, J. J. Streets, W. B. Schodde, J. W. O'Rourke, S. A. Withers, J. A. Withers and E. J. Creely.

Under the head of new business, Dr. Wadams moved that the thanks of the Association be tendered Assemblyman Berry for the great interest he had taken in Assembly Bill No. 210. Carried.

On motion by the secretary, a committee consisting of Drs. Wadams and Spencer, Sr., were appointed to convey the thanks of the Association to Assemblyman Berry in a suitable manner.

The subject-matter of sending a delegate to the next meeting of the United States Veterinary Medical Association was brought up by Dr. R. A. Archibald, who endeavored to portray to the members the necessity of such action on their part. He also stated that it was his opinion that if the Association evinced sufficient interest in the matter during the next two years that the United States Veterinary Medical Association would decide upon California as the place of meeting in the year 1897.

Dr. Spencer, Sr., also spoke on this subject in the same strain as the secretary had done.

The secretary moved that the Association levy an assessment of five dollars per capita for the purpose of defraying expenses of a delegate to the next meeting of the United States Veterinary Medical Association, also that the secretary be instructed to collect same, and at the same time notify the members that at next quarterly meeting, held in June, a delegate would be elected. The motion was duly seconded and after considerable favorable discussion it was eventually adopted unanimously.

Prof. W. F. Skaife, in behalf of the Faculty of the California Veterinary College, extended to the Association an invitation to hold their meeting in the college building when they again met in San Francisco.

The following resolution was presented and adopted unanimously:

WHEREAS, It is a notorious fact that during the twenty-ninth, thirtieth and thirty-first sessions of the State Legislature one Thomas Carpenter, a veterinary surgeon and a resident of Oakland, did use all means in his power to defeat any and all movements toward the advancement of the veterinary profession in the State; and

WHEREAS, This action on the part of the said Thomas Carpenter was wholly due to the jealous and abject sentiment which rankled in his breast toward the members of the California State Veterinary Medical Association and other members of the veterinary profession in the State, who are struggling to gain public recognition as practical sanitarians and as scientific gentlemen; and

WHEREAS, The veterinary profession in the State of California has suffered through the actions and machinations of the said Thomas Carpenter; and

WHEREAS, The said Thomas Carpenter is at the present time endeavoring to gain the position of Meat and Milk Inspector to the Board of Health of the City of Oakland; therefore

BE IT RESOLVED, That we the members of the California State Veterinary Medical Association do hereby protest against the appointment of the said Thomas Carpenter to the office of Meat and Milk Inspector in the City of Oakland, as we believe that such action on the part of the health authorities would work a hardship on the people of the City of Oakland and at the same time be a detriment to the interests of the veterinary profession throughout the State of California; and be it further

RESOLVED, That a copy of these resolutions be forwarded by the secretary to the Oakland Board of Health and that a copy be spread upon the minutes.

C. B. ORVIS, *President.*
R. A. ARCHIBALD, *Secretary.*

Upon motion the president, Dr. C. B. Orvis, was authorized to represent the Association at the next meeting of the State Sanitary Convention to be held in San Francisco on April 1.

The secretary moved that when this meeting adjourns it adjourns to meet in Stockton on Wednesday, June 12, 1895.

Upon motion the Association took a recess until 8 p. m.

EVENING SESSION.

The Association reconvened at 9 p. m. President Orvis in the chair.

Under the head of reading of papers and discussions, the president, Dr. C. B. Orvis, delivered his inaugural address:

GENTLEMEN.—In assuming the presidential chair of this Association for the ensuing year, permit me to thank you most sincerely for the honor you have conferred upon me. By being unanimously elected, I feel gratified at such an expression of your esteem and confidence. I know you have not given me this position for any special service I have done, or for any special professional ability. I consider it, therefore, a mark of

favor or respect for the common practitioner who has tried to do his duty in his district, both to his patrons and his profession, to the best of his ability.

It was with considerable diffidence that I allowed my name to be used for this important position and knowing, as I do, the capacity of the men whom I am to succeed, and the great amount of work accomplished and more begun, but uncompleted that we have to finish if we continue to prosper, makes me feel inadequate to the task.

To the secretary, the greater part of the burden of the Association falls, and I am thankful to know that in Dr. Archibald, who has served our Association so faithfully in the past, will continue the same zeal in the future, and as for myself, I promise you every effort for which I am capable for the welfare of the Association. Our efforts, however, will be of no avail unless we have your hearty co-operation ; but I feel sure it will be accorded us, and I therefore enter upon my duties with much confidence in the prosperity of our society for the present year. The value of these meetings are hard to estimate. We meet here together on a level, exchange ideas, relate experiences, report cases, etc., etc., then we go home refreshed. If on going home one cannot see where he has been slack or negligent in one way or another; if he does not feel like referring to text-books, case-books, etc., and brush the dust off his desk and shelves, and if he is not quicker to notice dirt in the hospital or an untidy box, and if he does not take a little extra pains to dust his clothes and black his boots, he has not received the same amount of enthusiasm that I have received. These are personal advantages and our program should be so arranged as to arouse this feeling and to educate each member in the different branches of our calling, and in this way we are best able to keep informed as to the use and application of the latest agents, methods and appliances, whereby we may become proficient and most skilled in our profession. Herein lies the secret of large membership and good attendance, but is second to the main object of our Association, viz. : To advance the standing of the veterinary profession and to obtain positions and recognitions that rightly belong to it. The plans for procedure to this end can best be discussed at our Association and committee meetings, but I will make no reference to them here.

In the past nine years (for that is the length of time I have been identified with the work in this State) the common people have been greatly enlightened as to the mission of the veterinarian. There is no longer a place for the empiric who says glanders is unknown here, or the man who went through the country armed with a saw who contended that nearly all horses could be greatly benefited by the use of that instrument applied in shortening the incisor teeth. While there are a few who still succeed in disposing of their so-called sure cures, they are becoming more scarce all the time and the qualified veterinarian is being consulted as to the reliability of said nostrums before purchases are made.

While there are many things to be proud of—the recognitions we have received and the advances we have made, yet we have many hindrances and oppositions that will require our most earnest and continuous efforts to overcome.

During the past year we have been more than commonly recognized by our Medical Brothers. They are recognizing the advisability of having skilled veterinarians as meat and dairy inspectors and recognizing their ability as sanitarians. They have invited and we have become members of the State Sanitary Board, and our essays, remarks and resolutions have received courteous attention and favorable mention.

Dr. Ruggles, president of the State Board of Health, has shown not only to me personally, but to the profession, many favors and courtesies. This same spirit has been more generally felt throughout the State of late, all of which shows to my mind that we are showing to the world by our professional and gentlemanly demeanor that we are entitled to a higher standing, both professionally and socially, than we have yet received. The very discourteous treatment a number of my friends and myself received at Stockton last May in carrying out the duties of a public office, at the hands of those connected with a State institution was entirely unwarranted and received the just condemnation of the press of the State and goes to show that the mass of the people are ready and willing to accord us that esteem and confidence we so much desire.

Within the last few months the State University has established a branch in the form of a Veterinary College. In this connection I feel like giving special credit to those by whose efforts the California Veterinary College has been established,

notably, Drs. McNutt and Bohill. The adoption of a curriculum comprising three college years is commendable, and it is hoped that the requirements for matriculants adopted will be strictly adhered to, so that none but gentlemen of intelligence and ability, coupled with a fair general education, can gain admission to the college.

It would also be highly gratifying to me should the directors adopt the plan of having competent professional men to conduct the examinations in place of having the teacher examine his own pupils. This plan in effect will be eventually adopted by all the colleges we believe. The California Veterinary College properly conducted can't help but be a power in advancing the standing of the profession on this coast.

The defeat in the Legislature of the bill providing for State and County Veterinarians, quarantine laws, etc., is to be regretted. The need of such a law is apparent at every hand. The extent that contagious animal diseases are allowed to exist without restrictions in this State is unparalleled, so far as I am informed. While the present condition is highly detrimental to the live-stock interests of the State, we, as veterinarians can console ourselves with the fact that the greater the amount of disease, the more the practice for the general practitioner, until such time shall come that our efforts for the best interests of our agriculturists shall be better appreciated by our legislators.

In our Association we have demonstrated the strength of unity of action and purpose, for nearly everything that has been accomplished in our State in the past nine years of importance to the profession has been done by the energies of this Association, and its members. In the past our numbers have been small, but with our now quite large and increasing membership if we can enthuse that same energy and unity of sentiment (and there is room for more harmony than has been displayed) into our large membership, we will indeed be a power; and judging from what has been accomplished in the past, we will soon be on equal terms with the profession in any of our Eastern States, if in fact we do not surpass them in professional standing.

Now, before closing my remarks, I desire to draw your attention to another matter, one that it seems to me has caused a great deal of discredit to be given to the veterinarian, and all because we have allowed people to be misinformed. I refer to

the nature of glanders, as understood by the ordinary horse owner. Much of the matter taught and written upon this subject I think most of you gentlemen will agree with me is incorrect—at least misleading.

Glanders is a loathsome and much-to-be-dreaded contagious disease, not because, as people think, it is very rapidly fatal, and because one animal has it all other animals susceptible must likewise contract the disease and shortly die that have been in close proximity to said diseased animal, but more properly because it shows itself in so many different forms and exists many times without outward manifestations, or but so slightly as not to cause suspicion of disease, but all the time said animal is spreading the disease to other animals of susceptible species. Also, because as a rule, the beast has to submit to a long, lingering disease from which there is no hope of recovery. I inform my patrons in the following manner:

Glanders is a contagious disease communicable to man and nearly all the domestic animals—the ox being a notable exception. That it usually runs a slow course with periods of latency and acceleration. That the disease at all times and stages is dangerous, but that at times the virus, if present, is much less active and the disease consequently less contagious. That the period of incubation is uncertain. That if once inoculated no known agent will prevent the development of the disease, and that mallein will detect the presence of the disease if it exists, whether there are any visible manifestations or not. Impress upon them the necessity of extreme vigilance in order to detect the hidden workings of the very prevalent disease. Refute the assertion that the left nostril is necessarily the location of the disease in glanders, or that an unthrifty condition of the animal always accompanies it.

I make mention of glanders because of the gravity and prevalence of the disease; and on account of the seriousness of the existing condition, the people should have a correct knowledge of it.

With proper laws and competent officials to execute them, with the use of mallein in diagnosis, this ever dreaded disease should become unknown in the near future to the common practitioner. I should like to say more of this valuable agent and also of tuberculin and antitoxin, but not choosing to intrude on your valuable time longer, I will desist.

The address was listened to with much interest, and the applause that followed showed the manner in which it was appreciated.

The next business on the program was the reading of a very interesting and instructive paper by Dr. H. A. Spencer, entitled "Antiseptic Surgery." As usual the doctor submitted for the consideration of the members a spicy, practical and well-written thesis. The discussion that followed demonstrated the fact that the subject was well chosen, as the members to a man participated in the discussion, and showed by their attention and interest that they considered it to be one of the most important subjects that could have been submitted to them.

Owing to the unavoidable absence of Drs. Faulkner and Jackson, who were also appointed essayists for this meeting, no more papers were presented, but several interesting cases were reported by the different members.

Upon motion a vote of thanks was tendered Drs. Orvis and Spencer, Sr., for the able and zealous manner in which they had entertained the meeting.

The chair appointed the following-named gentlemen as essayists for the next meeting—Drs. Fox, Skaife, Eddy and Fabbi.

The secretary made his regular quarterly statement regarding the advisability of as many of the members as possible joining the United States Veterinary Medical Association, he stated that he could supply application blanks to those who wished to make application for membership.

Drs. H. A. Spencer and H. F. Spencer extended to the members a cordial invitation to meet at their hospital and participate in a clinical entertainment. In behalf of the members, the chair accepted the invitation in the same spirit in which it was given.

There being no further business before the meeting it adjourned to meet in Stockton on June 12, 1895.

Clinical Entertainment.

On March 14, 1895, at 9 a. m., the members of the California State Veterinary Medical Association assembled at the Veterinary Hospital on 224 East St. John street, San José, on invitation of Drs. H. A. Spencer and H. F. Spencer, to participate in a clinical entertainment.

The first and second operations on the program were the castration of a double cryptorchid and a single cryptorchid by Dr. H. A. Spencer. In the performance of these operations the doctor demonstrated the fact that he has no superior as an operator in the United States.

The third operation on the program was the extirpation of a champignon by Dr. Archibald, ably assisted by Dr. H. F. Spencer. The operator demonstrated his method of operating on these cases on the operating table. The tumor resected was quite large and as far as its removal was concerned it was successfully accomplished.

The fourth operation on the program was ovariotomy in a bitch by Dr. Archibald. This proved to be a peculiar case, inasmuch as it was found when the operation was well advanced, that the animal was pregnant; however, the operation was completed, and from latest accounts the bitch seems to be doing well.

The fifth operation was the application of the actual cautery for the cure of side-bones. This operation was demonstrated by Dr. J. R. Shaw, who performed

the operation with the thermo-cautery. The members were loud in their praises of the manner in which the operation was performed.

The sixth operation was the removal of a number of hypertrophied lymphatic glands from the neck of a dog. This operation was performed by Dr. H. F. Spencer, who gave ample proof of his ability as a surgeon of no ordinary skill and ingenuity.

The seventh operation was the amputation of the leg of a fox-terrior bitch at the tibial region. This operation was performed by Drs. Spencer, Jr., and Archibald.

The members highly commended the manner in which the entertainment was provided for by the San José veterinarians, and upon the completion of the seventh and last operation they dispersed to their respective localities, with the feeling that the time purloined from their business was by no means thrown away, and all expressed the conviction that clinical entertainments in connection with our meetings were a success, and that in future no ordinary circumstances would prevent them from being present at similar entertainments.

R. A. ARCHIBALD, V. S.,
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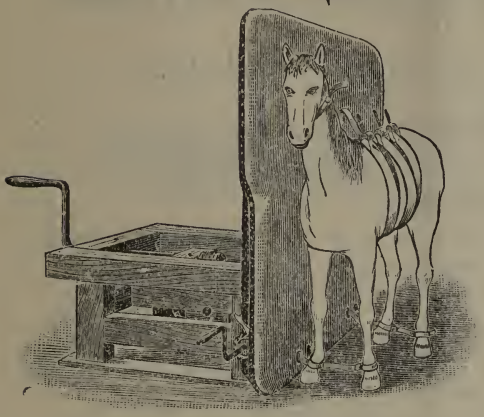

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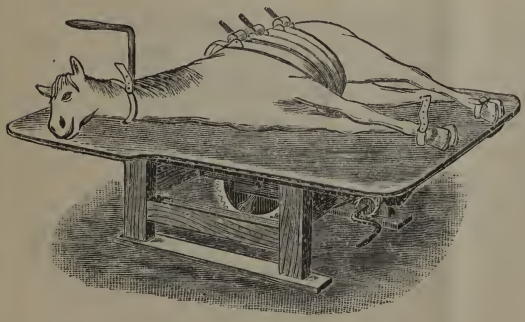

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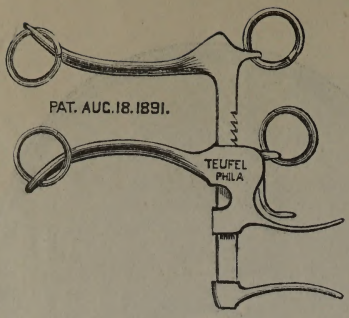

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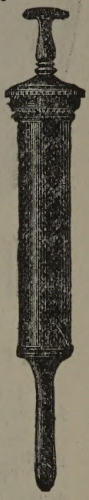

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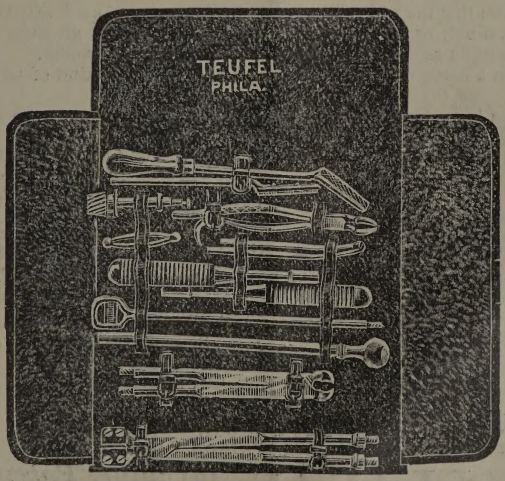

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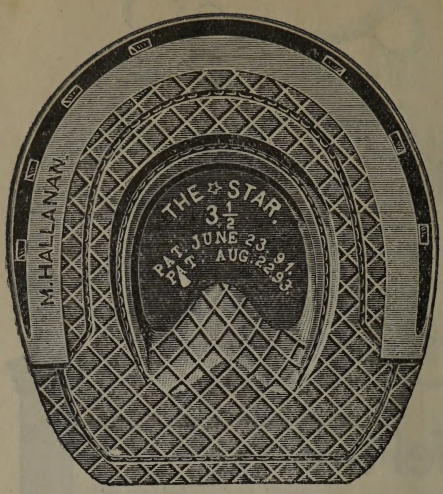

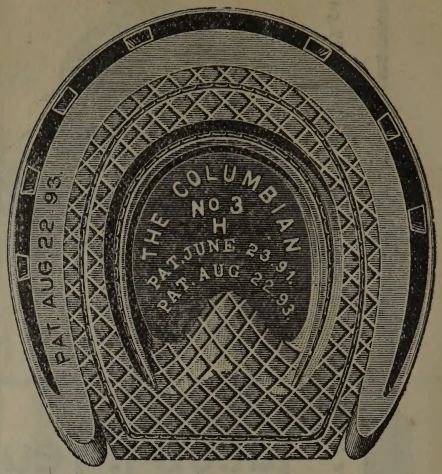

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